No. 12848

United States
Court of Appeals
For the Ninth Circuit.

THE PARKER APPLIANCE COMPANY, a Corporation,

Appellant,

vs.

IRVIN W. MASTERS, INC., and JOSEPH C. COLLINS, Doing Business Under the Firm Name and Style of Collins Engineering Company,

Appellee.

Transcript of Record
IN FOUR VOLUMES
Volume IV
Book of Exhibits
(Pages 1323 to 1473)

**Appeal from the United States District Court,
Southern District of California
Central Division.**

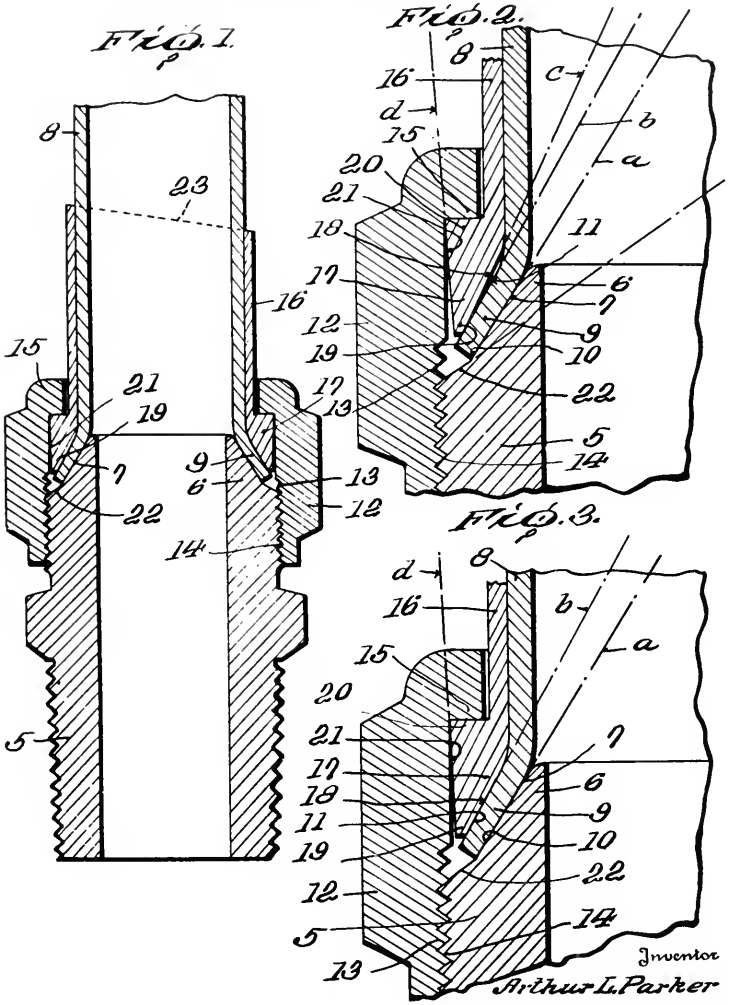
Phillips & Van Orden Co., 870 Brannan Street, San Francisco, Calif.

1323

Aug. 20, 1940. A. L. PARKER 2,212,183

TUBE COUPLING

Original Filed March 2, 1938



Inventor
Arthur L. Parker

By Mann & Porter
Attorneys

UNITED STATES PATENT OFFICE

2,212,183

TUBE COUPLING

Arthur L. Parker, Cleveland, Ohio

Application March 2, 1938, Serial No. 193,569
Renewed January 18, 1940

3 Claims. (Cl. 285—86)

The present invention relates to new and useful improvements in tube couplings, and more particularly to improvements in couplings for clamping the flared ends of metal tubes such as are typified in U. S. Letters Patents to Arthur L. Parker, 1,893,442 and 1,977,240 of January 3, 1933, and October 16, 1933, respectively.

An object of the invention is to provide a tube coupling wherein the coupling members are so constructed and dimensioned that the flared end of the tube is firmly contacted with throughout the greater portion of the flared end so as to provide a tight and efficient seal.

A further object of the invention is to provide a tube coupling of the above type wherein the outer clamping member engaging the flared end of the tube is so dimensioned and shaped that contact is first made at the free end of the clamping member whereby the clamping member is caused to expand, thus bringing the entire clamping surface into intimate contact with the outer surface of the flared end of the tube with a resulting tight and efficient seal.

A still further object of the invention is to provide a coupling of the above type wherein the clamping member engaging the outer surface of the flared end of the tube consists of an inner and an outer sleeve, and wherein the clamping end of the inner sleeve which contacts with the flared end of the tube is so shaped as to be free from radial contact with the outer sleeve when the coupling members are in firm gripping contact with said flared end of the tube.

With the above and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawing.

In the drawing:

Figure 1 is a central longitudinal section illustrating the invention.

Figure 2 is an enlarged fragmentary section illustrating the initial engagement of the sleeve with the external flared end surface of the tube.

Figure 3 is a view similar to Figure 2 and illustrates the ultimate clamping contact of the sleeve and clamping member surfaces.

The improved coupling consists of a male member 5, having a projecting portion 6 provided with a tapered seat 7. The tube to be clamped is indicated at 8, and this tube is flared at its end, by a suitable flaring tool, as indicated at 9. Any suitable flaring tool may be used to give to the inner face 10 of the flared end of the tube an angular positioning, substantially the same as the angle of the seat 7 against which it is to be clamped. This flaring of the end of the tube thins the tube so that it decreases in thickness from the point of commencement to the extreme outer end of the flared portion. Thus the outer surface 11 of the flared end of the tube bears angular relation to the inner surface 10 as will be readily observed by reference to the dotted lines *a*, *b* forming continuations of said surfaces in Figures 2 and 3. In practice, the male member extension surface 7 and the flared end inner surface may be disposed at an angle of approximately thirty degrees with respect to the coupling axis, whereas the flared end outer surface is disposed at a more acute angle approximating twenty-eight degrees.

The coupling includes a female member formed in two sections. The outer section or clamp nut 12 is in the form of a sleeve having internal threads 13 adapted to engage the external threads 14 on the male member 5, and inwardly directed clamping shoulder 15. The female coupling member also includes an inner clamping sleeve 16 which has a telescoping connection with the outer sleeve 12, and the inner sleeve is provided with a head 17, the inner face of which is formed with a flared portion 18 adapted ultimately to have full surface contact with the outer surface 11 of the flared end 9 of the tube as shown in Figure 3 of the drawing. It will be observed by reference to the dotted line extension *c* in Figure 2 of the drawing that the flared surface 18 is formed so as to normally bear more acute angular relation to the coupling axis than does the flared tube end outer surface 11 which it is adapted to engage in clamping relation. Thus, during the assembling and clamp-setting of the coupling the extreme end or nose 19 of the inner sleeve head initially engages said outer surface 11. The head 17 includes a clamping shoulder 20 adapted to receive the longitudinal thrust imparted by the clamping shoulder 15 of the clamp nut or outer sleeve member 12, and the external wall of the nose is slightly tapered as at 21 so as to form a wedge-shaped clearance between said wall and the adjacent internal wall of the member 12. By reference to the dotted line extension *d* in Figures 2 and 3 of the drawing the angular position of the wall surface 21 will be clearly discernible.

At the base of the tapered surface 7 of the male extension 6 the surface flares abruptly as at 22 so as to form an abutment for the flared end 9 of

the tube 8 without providing a positive limiting stop.

The outer end of the inner sleeve 16 terminates in an angularly disposed edge 23, that is, the sleeve terminus is not disposed in a line truly transverse or in right angular relation to the axis of the tube 8. By thus forming the tube end, bending strains or vibrations set up in the tube 8 are not localized at a single point, across the diameter, or in the length of said tube.

In Figure 2 of the drawing, partial assembly of the coupling is illustrated, and in Figures 1 and 3 complete assembly or the fully clamped condition of the parts is shown. It will be observed by reference to these figures that during the assembly of the coupling the nose 19 alone first contacts the outer surface 11 of the tube flare, and upon continued application of end thrust by the screwing on of the member 12 and engagement of the clamping shoulders 15 and 26, the head 17 will be spread or displaced radially outwardly to store gripping tension in said head and move forwardly along the flared end of the tube to cause the clamping surfaces 11, 18 and 7, 10 to tightly contact throughout the whole of their respective areas. During the displacement or outward spreading of the head 17 the wall 21 thereof will approach the adjacent wall of the sleeve member 12, but the degree of taper of said head wall is such that it will never contact and bind against said sleeve member wall. It is noted that the clamping shoulder on the head 17 is spaced a distance back from the inner flare surface of said head and the outer surface of the head and said inner wall of the coupling are so dimensioned that the head will contact with the nut in the region of the clamping shoulder, while the remaining portion of the head is free from contact with the coupling member, and therefore, the clamping force of the head against the tube is determined by the spring tension of the metal forming the head. In other words, the inner flare surface of the sleeve will yieldingly clamp the flared tube end while unlimited expansion of that portion of the head adjacent the clamping shoulder will be prevented.

With the coupling parts proportioned and arranged as herein described, remarkably better results in the way of efficient clamping are obtained than have been obtainable heretofore. Wider seating areas are provided, all danger of the inner sleeve head sticking in the outer sleeve or nut is avoided, and a measure of spring tension is stored in the sleeve head 17 by the spreading thereof which is found to be very effective in aiding retention of the desired clamped relation of the tube flare surfaces and the surfaces which they engage.

While I have illustrated the invention embodied in a tube coupling wherein the seat against which the flared end of the tube is clamped is in the form of a male member and the nut cooperating with the inner sleeve is in the form of a female member, it is obvious that these parts may be reversed and the clamping seat formed of a female member while the sleeve is forced against the tube end by a male member. It is also obvious that minor changes in the details of construction and the shaping of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. In a coupling for tubes having the ends thereof flared, coupling members having threaded engagement with each other, one of said coupling members having a seat associated therewith adapted to engage the inner face of the flared end of the tube and the other coupling member having a clamping shoulder, a sleeve surrounding said tube and having a solid head provided with a shoulder against which the clamping shoulder of the coupling member engages, said head having the inner surface thereof provided with a coniform flare so shaped that the initial contact of the head with the flared end of the tube is at the free end of the head and adjacent the outer end of the flared end of the tube, whereby during the clamping action said head will be expanded and moved forward along the flared end of the tube into intimate contact with the outer surface thereof throughout substantially the entire extent of the flared surface on the sleeve head.

2. In a coupling for tubes having the ends thereof flared, coupling members having threaded engagement with each other, one of said coupling members having a seat associated therewith for engaging the inner flare of the flared end of the tube and the other coupling member having a clamping shoulder and an inner wall, a sleeve surrounding said tube and having a solid head capable of radial expansion during the clamping action, said head being provided with a clamping shoulder against which the shoulder of the coupling member engages and an inner flare surface for engaging the outer flared end of the tube, said clamping shoulder being spaced a distance back of the inner flare surface, the outer surface of said head and the said inner wall of the coupling member being so shaped relative to each other that when the sleeve head expands during the clamping action they will contact only in the region of the clamping shoulder, the remaining portion of the head being free from contact with the coupling member whereby the clamping force of the head against the tube is determined by the spring tension of the metal forming said head.

3. In a coupling for tubes having the ends thereof flared, coupling members having threaded engagement with each other, one of said coupling members having a seat associated therewith adapted to engage the inner face of the flared end of the tube and the other coupling member having a clamping shoulder, a sleeve surrounding said tube and having a solid head provided with a shoulder against which the clamping shoulder of the coupling member engages, said head having the inner surface thereof provided with a coniform flare so shaped that the initial contact of the head with the flared end of the tube is at the free end of the head and adjacent the outer end of the flared end of the tube, the outer surface of said head and said inner wall of the coupling member being so shaped relative to each other that when the sleeve head expands during the clamping action, the portion of said head contacting with the flared end of the tube is at all times out of contact with the coupling member whereby the clamping face of the head against the tube end is determined by the spring tension of the metal forming said head.

ARTHUR L. PARKER.

PLAINTIFF'S EXHIBIT No. 2

Liber B198 Page 4 Conformed

Assignment

U. S. Patents

Whereas, I, Arthur L. Parker, of Cleveland, Ohio, am the owner of certain Letters Patent of the United States, and

Whereas, The Parker Appliance Company, a corporation of the State of Ohio, with its principal place of business at Cleveland, Ohio, is desirous of acquiring the entire interest in and to said patents and the inventions covered thereby.

Now, Therefore, in consideration of the payment by The Parker Appliance Company to me of One Dollar ($1.00), and other good, legal and valuable considerations, receipt of which is hereby acknowledged, I Arthur L. Parker by these presents do sell, assign and transfer unto The Parker Appliance Company, its assigns and legal representatives, the whole right, title and interest in and to the said Letters Patent as identified and listed below; together with all rights to reissue any such patents, and together with all improvements on the inventions covered by any of such patents which I may now or hereafter make, own or control, and together with all rights to recover for past infringement on any such patents.

Patent No.	Patentee	Issue Date	Title
1,619,755	A. L. Parker	3- 1-1927	Tube Coupling.
1,774,841	A. L. Parker	9- 2-1930	Combined Tube and Pipe Coupling.
1,835,179	A. L. Parker	12- 8-1931	Flaring Tool for Shaping Pipe Ends.
1,887,423	A. L. Parker	11- 8-1932	Tank Flange Coupling.
1,893,441	A. L. Parker	1- 3-1933	Tube Coupling.
1,893,442	A. L. Parker	1- 3-1933	Tube Coupling.
1,894,700	A. L. Parker	1-17-1933	Coupling and Washer Assembly.
1,901,820	A. L. Parker	3-14-1933	Solder Fittings and Method of Soldering.
1,912,299	A. L. Parker	5-30-1933	Flexible Coupling System.
1,934,878	A. L. Parker	11-14-1933	Primer for Gas Engines.
1,942,255	A. L. Parker	1- 2-1934	Primer for Gas Engines.
1,977,240	A. L. Parker	10-16-1934	Tube Coupling.
1,977,241	A. L. Parker	10-16-1934	Tube Coupling.
1,980,927	A. L. Parker	11-13-1934	Bonding Composition of Solder and Flux and Art of Making the Same.
1,982,533	A. L. Parker	11-27-1934	Coupling for Rubber Covered Tubes.
2,027,285	A. L. Parker	1- 7-1936	Method of Forming Seamless Tube Couplings.
2,035,978	A. L. Parker	3-31-1936	Flexible Fitting for Tubes.
2,044,629	A. L. Parker	6-16-1936	Check Valve for Fluid Pressure Pipes.
2,053,626	A. L. Parker	9- 8-1936	Elastic Coupling for Tubes.
2,064,268	A. L. Parker	12-15-1936	Buffer for Fluid Pressure Indicators.
2,075,458	A. L. Parker	3-30-1937	Disk Valve Assembly.
2,075,459	A. L. Parker	3-30-1937	Cylindrical Valve.
2,075,460	A. L. Parker	3-30-1937	Valve Assembly.
2,082,716	A. L. Parker	6- 1-1937	Water Gauge.
2,086,173	A. L. Parker	7- 6-1937	Booster for Engine Primers.
2,087,356	A. L. Parker	7-20-1937	Valve Control Mechanism.
2,089,133	A. L. Parker	8- 3-1937	Tube Flaring Tool.

Patent No.	Patentee	Issue Date	Title
2,090,266	A. L. Parker	8-17-1937	Elastic Coupling for Tubes.
2,092,135	A. L. Parker	9- 7-1937	Pipe Coupling.
2,098,256	A. L. Parker	11- 9-1937	Method of Preventing Contact Seizure of Metal Parts.
2,102,214	A. L. Parker	12-14-1937	Art of Preventing Seizure of Contacting Surfaces of Soft Alloys and Like Materials.
2,109,801	A. L. Parker	3- 1-1938	Valve Mechanism.
2,127,185	A. L. Parker	8-16-1938	Tube Bender.
2,129,231	A. L. Parker	9- 6-1938	Selector Valve.
2,158,478	A. L. Parker	5-16-1939	Pressure Relief Valve.
2,164,471	A. L. Parker	7- 4-1939	Flexible Coupling for Tubes.
2,185,564	A. L. Parker	1- 2-1940	Energizer for Gas Engines.
2,189,674	A. L. Parker	2- 6-1940	Fuel Distributing Unit.
2,189,675	A. L. Parker	2- 6-1940	Fuel Distributing Device.
2,191,582	A. L. Parker	2-27-1940	Tube Coupling.
2,196,120	A. L. Parker	4- 2-1940	Valve Mechanism.
2,202,960	A. L. Parker	6- 4-1940	Valve Assembly.
2,202,961	A. L. Parker	6- 4-1940	Valve Assembly.
2,209,132	A. L. Parker	7-23-1940	Valve Assembly.
2,209,133	A. L. Parker	7-23-1940	Valve Assembly.
2,209,134	A. L. Parker	7-23-1940	Valve Assembly.
2,209,135	A. L. Parker	7-23-1940	Valve Assembly.
2,209,136	A. L. Parker	7-23-1940	Valve Assembly.
2,212,183	A. L. Parker	8-20-1940	Tube Coupling.
2,222,629	A. L. Parker	11-26-1940	Method of Forming Various Units From Standardized Blanks.
2,229,587	A. L. Parker	1-21-1941	Flexible Coupling for Tubes.
2,229,903	L. H. Schmohl et al.	1-28-1941	Metering Valve.
2,229,931	A. L. Parker	1-28-1941	Valve.
2,229,932	A. L. Parker	1-28-1941	Valve.

Patent No.	Patentee	Issue Date	Title
2,229,933	A. L. Parker	1-28-1941	Valve.
2,236,327	A. O. Bates	3-25-1941	Metal Working Tool Forming Attachment for Lathes.
2,239,795	A. L. Parker	4-29-1941	Balanced Plug Valve.
2,240,413	A. L. Parker	4-29-1941	Coupling.
2,251,715	A. L. Parker	8- 5-1941	Tube Coupling.
2,251,716	A. L. Parker	8- 5-1941	Coupling for Tubes.
2,251,717	A. L. Parker	8- 5-1941	Coupling for Tubes.
2,251,718	A. L. Parker	8- 5-1941	Coupling for Tubes.
2,257,427	A. L. Parker	9-30-1941	Angle Fitting and Method of Making Same.
2,266,795	A. L. Parker	12-23-1941	Apparatus for Preparing Flared End Tubes.
2,266,796	A. L. Parker	12-23-1941	Tube Assembling Method.
2,274,731	A. L. Parker	3- 3-1942	Valve Assembly for Fuel Systems.
2,277,713	A. L. Parker	3-31-1942	Thread Protector.
2,278,479	A. L. Parker	4- 7-1942	Tube Coupling.
2,287,900	A. L. Parker	6-30-1942	Priming Valve Assembly.
2,289,382	A. L. Parker	7-14-1942	Tube Coupling.
2,290,890	A. L. Parker	7-28-1942	Tube Coupling.
2,300,464	A. L. Parker	11- 3-1942	Hose Coupling.
2,303,061	A. L. Parker	11-24-1942	Apparatus for Preparing Flared End Tubes.
2,304,390	J. N. Wolfram	12- 8-1942	Coupling.
2,304,844	A. L. Parker et al.	12-15-1942	Fuel Cut-Off Valve and Operating Mechanism Therefor.
2,306,221	A. L. Parker et al.	12-22-1942	Pipe Bending Machine.
2,306,223	A. L. Parker et al.	12-22-1942	Automatic Tube Bending Machine.
2,306,224	A. L. Parker et al.	12-22-1942	Automatic Tube Bending Machine.
2,308,300	A. L. Parker	1-12-1943	Valve Assembly.
2,309,666	A. L. Parker	2- 2-1943	Method of Forming Standard Blanks and a Variety of Finished Units Therefrom.

Patent No.	Patentee	Issue Date	Title
2,311,078	A. L. Parker	2-16-1943	Engine Primer.
2,311,464	A. L. Parker	2-16-1943	Valve Assembly.
2,311,465	A. L. Parker	2-16-1943	Valve Assembly.
2,311,772	A. L. Parker	2-23-1943	Antiseize Lubricating Compound for Threads and Its Method of Preparation.
2,312,121	A. L. Parker et al.	2-23-1943	Tube Bending Jig.
2,312,122	A. L. Parker et al.	2-23-1943	Pipe Bender.
2,314,512	A. L. Parker	3-23-1943	Valve Assembly for Fuel Systems.
2,316,711	A. L. Parker et al.	4-13-1943	Tube Coupling.
2,316,806	A. L. Parker	4-20-1943	Tube Coupling.
2,318,962	A. L. Parker	5-11-1943	Valve Assembly.
2,318,963	A. L. Parker	5-11-1943	Valve Assembly.
2,318,964	A. L. Parker	5-11-1943	Valve Assembly.
2,318,965	A. L. Parker	5-11-1943	Valved Coupling.
2,321,384	H. W. Hemker et al.	6- 8-1943	Compound for Sealing and Lubricating Relatively Moving Parts.
2,321,414	A. L. Parker	6- 8-1943	Art of Sealing and Locking Threads.
2,322,877	A. L. Parker	6-29-1943	Coupling.

Said inventions and Letters Patent to be held and enjoyed by the said The Parker Appliance Company for its interest, for its own use and behoof, and for its legal representatives, to the full end of the term for which said Letters Patent may be granted, as fully and entirely as the same would have been held by me had this assignment and sale not been made.

Executed this 28th day of December, 1943, at Cleveland, Ohio, as of July 1, 1943.

[Seal] /s/ ARTHUR L. PARKER.

State of Ohio,
County of Cuyahoga—ss.

On the 28th day of December, 1943, personally appeared before me, Arthur L. Parker, to me known to be the person who signed the foregoing assignment, and acknowledged the execution thereof to be his free and voluntary act and deed.

/s/ HELEN TUSIN,
Notary Public.

My commission expires 2-25-45.

Recorded U. S. Patent Office Dec. 30, 1943.

CONWAY P. COE,
Commissioner of Patents.

Liber B198 Page 4

Received in evidence June 14, 1950.

[Endorsed]: Filed December 29, 1947. Plaintiff's Exhibit No. 2 attached to the Complaint.

PLAINTIFF'S EXHIBIT No. 12

Deposition of Irving W. Masters

Received in evidence June 14, 1950

[See pages 1225 to 1262, Vol. III, of this printed record.]

PLAINTIFF'S EXHIBIT No. 12A

Irvin W. Masters, Inc.
1060 N. Lake Street
Burbank, California

April 27, 1949.

Mr. Larry Cunningham,
Purchasing Agent, Republic Aviation Corp'n.
Farmingdale, Long Island
New York

Dear Mr. Cunningham:

In connection with a Patent Infringement suit pending against Irvin W. Masters, Inc., which has been brought by Parker Appliance Company, and which is due to go to trial May 31st, depositions are to be taken in New York on May 10 and 11 at the instance of the Parker Appliance Company, and persons deposing are Roland Berg, Wm. D. Clark and W. Howard Ehmann of Republic Aviation Company.

We assume that these depositions being taken at the instance of the Parker Appliance Company

are calculated to be beneficial to the case of the Parker Appliance Company.

We are defending this action to the best of our ability, and believe that their patent will be held invalid. However, we are calling this matter of the depositions to your attention, being under the impression that these men are testifying as individuals, and not as representatives of the Republic Aviation Corporation. If such is the case, we believe it to the best interests of the Republic Aviation Corporation and the entire aviation industry, to give consideration to the fact that anything which contributes to the reestablishment of the Parker fitting monopoly will contribute to the old situation of long delays in the procurement of fittings, and where high prices in general existed.

I do not know what Mr. Clark's or Mr. Ehmann's attitudes may be, but I have known for the past seven years that Roland Berg was very pro-Parker, and apparently he is still under the hypnosis of the late departed Mr. Parker. If, as is probably the case, Mr. Berg's devotion to the Parker outfit is a matter of engineering convictions, we, nor anyone else can properly take exception to an honest testimony, and we are not seeking to influence that, but sometimes in these trial matters much is made of points in depositions which make the defense more difficult because of the confusion, and not because of the merits involved.

We believe the interests of Republic Aviation and the rest of the aircraft industry in this case are

at stake, and we are therefore taking the liberty of writing you.

Very truly yours,

IRVIN W. MASTERS, INC.,

/s/ IRVIN W. MASTERS,
President.

IWM-J

Received in evidence June 14, 1950.

PLAINTIFF'S EXHIBIT No. 13

Deposition of Joseph C. Collins

Received in evidence June 14, 1950

[See pages 1263 to 1296, Vol. III, of this printed record.]

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B

#14 · 1336

Plaintiff's Exhibit No. 14
JUN 14 1950

RECEIVED

PRINT NO.
THE PARKER APPLIANCE CO

February 13, 1943

In Response of Detailed
P. [illegible]

Irvin W. Masters

3036 Andrita Street

Los Angeles, California

Mr. George E. Blake PA-30

Gentlemen:

Complying with your request of the [illegible] of our Cleveland office for drawings and permission to manufacture certain Parker patented products, we are enclosing herewith copies of the following detailed drawings:

A18-2741-27 [illegible]
A1-2837-18C A8-2941-9

PARKER COPY

In the interest of the war effort these drawings are released to you in order that you may manufacture the products illustrated therein. It is understood that the permission herein given is limited to the particular parts shown on the enclosed drawings.

We consent to the manufacture by you of the items illustrated on the enclosed drawings without royalties subject to the following arrangements:

1. This arrangement is to remain in effect for the duration of the present war and is to terminate upon cessation of hostilities.

2. All items manufactured by you under this arrangement shall conform strictly to the specifications and tolerances as shown by the above mentioned drawings and shall be so marked as to identify the same as being of your manufacture.

If this arrangement meets with your approval, please indicate your acceptance on the enclosed carbon copy of this letter and return it to us.

Very truly yours,

THE PARKER APPLIANCE COMPANY
Pacific Coast Branch

Paul F. Smith
Branch Sales Manager

PFS:mg
encls.
cc: U.S. Army
Att. Hubert

ACCEPTED:
IRVIN W. MASTERS

By Geo. E. Blake Date 7-2-43

PLAINTIFF'S EXHIBIT No. 15

The Parker Appliance Company
17325 Euclid Ave.
Cleveland, Ohio
U. S. A.

Dec. 7, 1943

Date: December 3, 1943
Subject:
Re Yours: November 30, 1943

In Reply Refer to: F. E. Amon

Dear Sir:

As promised at the last Industry Advisory Committee Meeting, we are enclosing copies of the following detailed data sheets on the AC811 series fitting:

811T	811CT-45°	811JT
811	811ET	811MT
811BT	811FT	811OT
811CT	811GT	811RT
		811ST

(811HT omitted)*

You will note that these sheets are not set up to cover deviations in materials such as the X1315 or X1335 steel being used as a substitute for nickel steel, specification 57-107-17, minimum tensile strength 125,000 pounds.

Also, we suggest that for your protection you apply to the Engineering Data Officer at the Western Procurement District for official release of these

prints, to insure that they are coordinated properly for use as inspection prints.

Very truly yours,

THE PARKER APPLIANCE COMPANY,

/s/ F. E. AMON,
Sales Manager.

FEA:jes

P.S.

The attached prints are not very clear. In a day or two we will be able to get a more readable set and will forward them to you immediately upon receipt.

[*In longhand on original.]

Received in evidence June 14, 1950.

PLAINTIFF'S EXHIBIT No. 15A

December 9, 1943

Army Air Forces
Western Proc. District
Alhambra Area Office
117 E. Colorado
Pasadena, California

Attn: Engineering Section

Gentlemen:

We would like to submit the attached prints received by us from the Parker Appliance Company

for your official release, to insure that they are coordinated properly for use as inspection prints.

Yours very truly,

IRVIN W. MASTERS, INC.,

By /s/ M. M. MILLER,
Standards Dept.

MMM/FB
cc: C. W. Leekley

Received in evidence June 14, 1950.

PLAINTIFF'S EXHIBIT No. 16

November 13, 1945

Revocation of Permission
Heretofore Granted Parker
Patents

Irvin W. Masters
3035 Andrita Street
Los Angeles, California

Gentlemen:

In our letter of August 12, 1943, we granted permission to Irvin W. Masters to manufacture certain Parker patented devices disclosed in drawings attached thereto and furnished thereafter from time to time. This permission was granted for the purpose of assisting in the advancement of the National Defense Program.

The National Defense Program has been terminated by the cessation of hostilities with Japan and

therefor we hereby revoke and cancel any and all permission heretofore granted for the manufacture of devices embodying Parker patents. Consequently, we ask that all of our aforementioned drawings be returned to us at your earliest convenience.

We take this opportunity of thanking you for your cooperation during the period of the National Defense Program. Your continued cooperation will be greatly appreciated.

This revocation will become effective as of the first day of December, 1945.

Very truly yours,

THE PARKER APPLIANCE COMPANY,

ADRIAN MEDERT,
Assistant Counsel.

AM:dd
Registered Mail
cc: Sales Department

(Parker copy)

Postoffice return receipt attached.

Received in evidence June 14, 1950.

Jan. 3, 1933. A. L. PARKER 1,893,442

TUBE COUPLING

Filed July 7, 1930

FIG. 1.

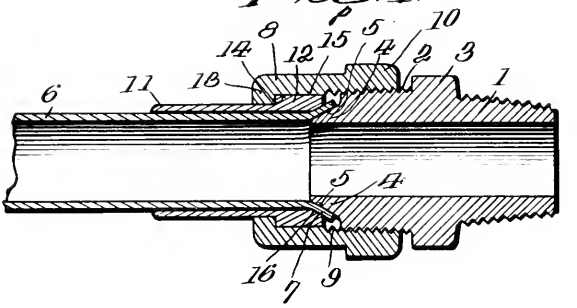
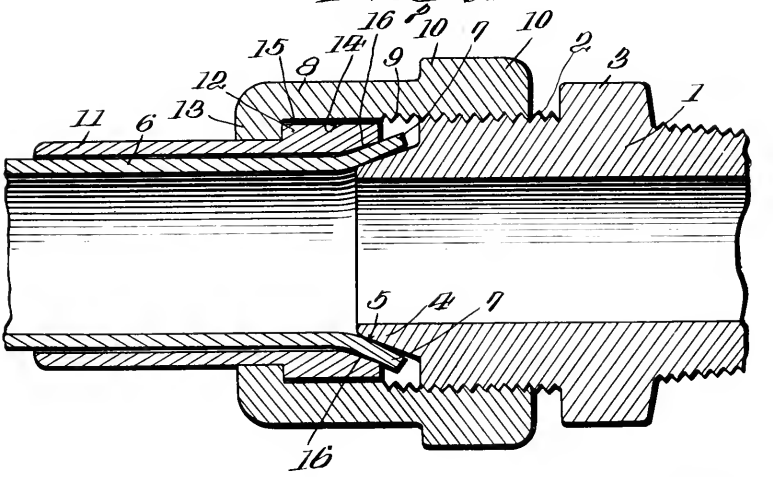


FIG. 2.



Inventor

Arthur L. Parker

By Stuntevant, Mason & Porter

Attorneys

Patented Jan. 3, 1933 1,893,442

UNITED STATES PATENT OFFICE

ARTHUR L. PARKER, OF CLEVELAND, OHIO

TUBE COUPLING

Application filed July 7, 1930. Serial No. 466,283.

The invention relates to new and useful improvements in tube couplings, and more particularly to a tube coupling for clamping the flared end of a tube.

An object of the invention is to provide a tube coupling consisting of a male member and a female member for clamping the flared end of a tube wherein said members are provided with tapered seats and the portions carrying the seats are so dimensioned as to yield to bring about an intimate clamping contact between the tapered seats and the flared end of the tube, and wherein said female member is formed in two sections, one of which has threaded engagement with the male member, and the other of which carries the seat contacting with the outer face of the flared end of the tube and is free from rotation during the final clamping action on the flared end of the tube.

In the drawing:—

Figure 1 is a sectional view through a tube coupling embodying the improvements and showing the members as clamping the flared end of a tube.

Fig. 2 is a similar view but showing the members in their position where they first contact with the flared end of a tube and before the parts are turned so as to bring about a clamping action on the tube end.

The tube coupling embodying the invention consists of a female member and a male member having threaded engagement with each other. The male member is provided with a tapered seat adapted to engage the inner face of the flared end of the tube. The female member is made in two parts and includes a sleeve having threaded engagement with the male member and turning thereon for bringing about a clamping of the tube end. It also includes a sleeve which engages the outer face of the flared end of the tube, and which is pressed against said flared face by the other section of the female member. The tapered seats on the male and female members are initially substantially parallel while the inner and outer faces of the flared end of the tube are at a slight angle to each other due to the thinness of the metal at the outer end of the flare during the forming of said flared end. The parts carrying the seats on the male and female members are so proportioned that during the final clamping action the metal will stretch or yield so as to bring about an intimate contact between the seats on the coupling members and the faces of the flared end of the tube.

Referring more in detail to the drawing the invention as illustrated includes a male coupling member 1 having its outer face threaded as indicated at 2. Said male member is provided with a portion having the faces thereof slabbed so as to serve as a nut for turning or holding said male member. This portion is indicated at 3 in the drawing. The bore of the male member is substantially the same as the bore of the tube to be clamped, and at the inner end of the male member there is a projecting portion 4 having an inclined face 5 which forms the inner tapered clamping seat. This portion 4 is adapted to extend into the flared end of the tube, which tube is indicated at 6 in the drawing. The flared end is indicated at 7. The female member of the tube coupling is formed in two sections. An outer sleeve section 8 is provided with threads 9 adapted to engage the threads 2 on the male member. Said female member is also enlarged and slabbed so as to provide a nut 10 whereby said female member may be turned or held for bringing about the clamping of the tube end. Said female coupling also includes an inner sleeve 11. The inner diameter of this sleeve 11 is substantially the same as the outer diameter of the tube, although a tolerance or clearance may be provided if desired. The inner sleeve 11 has a shoulder 12 and the outer sleeve 8 of the female coupling has a portion 13 which engages this shoulder 12 for forcing the sleeve 11 into clamping contact with the outer face of the flared end of the tube. The outer face 14 of the sleeve 11 is substantially cylindrical, and the inner face 15 of the sleeve 8 is substantially cylindrical. These two faces are of substantially the same diameter with sufficient clearance or tolerance to permit the turning of the outer sleeve 8 on the

inner sleeve 11 and easy endwise movement between these parts. The sleeve 11 of the female member is provided with an inclined tapered face 16 which forms the outer tapered seat which engages the outer face of the flared end of the tube. This tapered face 16 and the tapered face 5 are initially substantially parallel.

Both members of the female coupling are placed on the tube, after which the tube end is flared by a suitable flaring tool. The inclined face 16 of the female member serves as a gage for determining the flare of the end of the tube, and therefore the outer face of the flared end of the tube will be substantially at the same angle as the face 16 of the female member. When the female member of the coupling is threaded onto the male member of the coupling the tapered seats are first brought into contact with the inner and outer faces of the flared end of the tube, as shown in Fig. 2 of the drawings. As the parts are then further threaded onto each other the portions of the sleeve 11 radially opposed to the tapered seat 16 are so dimensioned that they will yield outwardly taking up the clearance or tolerance between the inner and outer sleeves of the female coupling so that the outward yielding movement of this section 11 of the female coupling is limited. Then the forces react through the flared end of the tube and the portion 4 of the male member of the coupling will yield so that the tapered seat 5 will enter into intimate contact with the inner face of the flared end of the tube. During the final clamping action the sleeve 11 does not turn with the sleeve 8 of the female member, but is merely forced endwise into tight clamping contact with the flared end of the tube. This avoids the friction incident to the rotation of the clamping members on the outer end during the final clamping thereof and greatly increases the efficiency and tightness of the coupling as it is finally seated in clamping contact with the tube end. This coupling is particularly adapted for heavy duty installations where it is necessary to use heavy tubing and considerable pressure in order to bring about a tight joint between the coupling parts and the tube end.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

A tube coupling comprising cooperating male and female members having threaded engagement with each other, said male member having an integral portion provided on its outer face with a smooth uniform tapered seat disposed at approximately an angle of thirty degrees to the longitudinal axis of the coupling and adapted to extend into the flared end of the tube, said female member being formed with inner and outer sleeve sections, said outer sleeve section being threaded so as to engage the threaded portion on the male member, the inner face of the outer sleeve and the outer face of the inner sleeve of the female member being substantially in contact, said inner sleeve having a tapered seat disposed at approximately the same angle as the tapered seat on said male member and adapted to engage the outer face of the flared end of the tube to be clamped, said inner sleeve section of the female member having a shoulder for rotatable engagement with a shoulder on the outer sleeve section thereof, said shoulders being disposed a substantial distance from the tapered portion of the inner sleeve section whereby said outer sleeve section may force the inner sleeve section endwise against the tube for clamping the same against the tapered seat on the male member.

In testimony whereof, I affix my signature.

ARTHUR L. PARKER.

Oct. 16, 1934. A L PARKER 1,977,240

TUBE COUPLING

Filed April 29, 1933

Fig. 1.

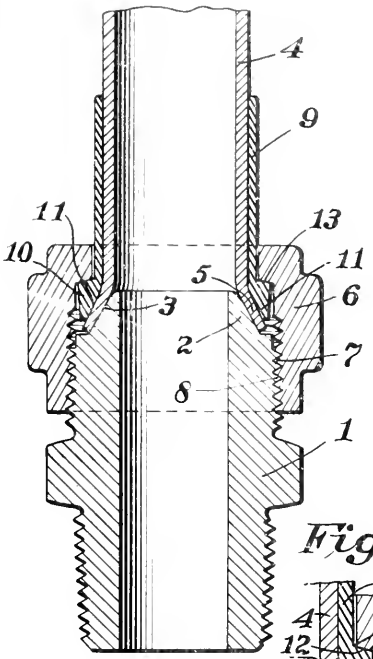


Fig. 2.

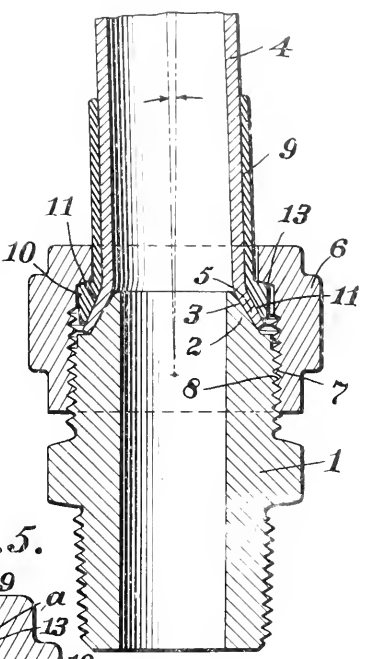


Fig. 5.

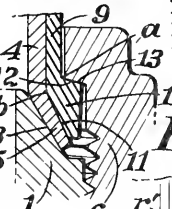


Fig. 3.

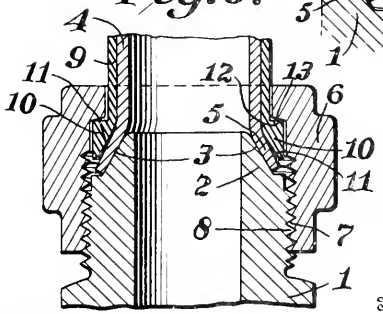
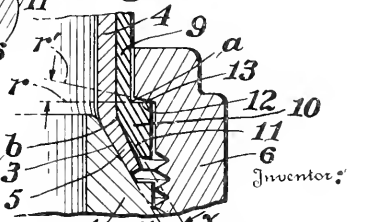


Fig. 4.



Inventor:
Arthur L. Parker,
By Stewart, Mason & Parker
Attorneys

Patented Oct. 16, 1934

1,977,240

UNITED STATES PATENT OFFICE

1,977,240

TUBE COUPLING

Arthur L. Parker, Cleveland, Ohio

Application April 29, 1933, Serial No. 668,642

2 Claims. (Cl. 285—86)

The invention relates to new and useful improvements in a tube coupling, and more particularly to a tube coupling for clamping the flared end of a tube. In my prior Patent #1,893,442, granted January 3, 1933, there is shown a tube coupling wherein the female member includes an inner sleeve and an outer sleeve, and the inner sleeve has a laterally projecting portion forming a shoulder which is engaged by an inwardly projecting shoulder on the outer sleeve so that the threading of the outer sleeve on to the male portion of the coupling member will force the seat on the inner sleeve into intimate contact with the flared end of the tube, clamping the same against the seat on the male member. The present invention relates to improvements in the construction of the coupling of my prior patent. The parts are so proportioned in the prior patent that the intimate clamping of the tapered end of the tube throughout substantially the entire region of the seats is accomplished principally by a yielding of the metal forming the tapered seat on the male member. An object of the present invention is to provide a coupling of this type wherein the clamping sleeve contacting with the outer face of the tapered end of the tube is so dimensioned as to bodily yield and bring about a firm clamping of the tube end substantially throughout the entire extent of the seating faces of the coupling members.

In the drawing—

Figure 1 is a longitudinal sectional view through a coupling embodying the improvements, said coupling members being fully seated clamping a tube end, with the tube substantially in alinement with the longitudinal axis of the couplings;

Fig. 2 is a similar view, but showing the tube and the clamping sleeve of the female member disposed at an angle to the longitudinal axis of the body portion of the coupling by the male member;

Fig. 3 is a view of the coupling members when initially brought into contact with the flared end of the tube, but before said coupling members are drawn together so as to seat and finally clamp the flared end of the tube;

Fig. 4 is a view similar to Fig. 3, on a larger scale, so as to show more clearly the dimensioning of the parts, and

Fig. 5 is a view similar to Fig. 4, showing the parts as finally drawn together.

The invention is directed to a triple coupling for tubes of the character shown in my prior patent. The coupling consists of a male member having a tapered seat adapted to extend into the flared end of the tube to be clamped. It also includes a female member formed in two sections. Said female member includes an inner clamping sleeve having a tapered seat adapted to engage the outer tapered face of the flared end of the tube. Said female member also includes an outer sleeve which has a threaded connection to the male member. The clamping sleeve is provided with a projecting portion on its outer face forming a shoulder adapted to be engaged by the shoulder on an inwardly projecting portion carried by the outer sleeve. The portion of the clamping sleeve between this shoulder and the extreme end of the sleeve is so dimensioned that it can bodily yield, and thus the clamping seat thereof be brought into intimate engagement with the outer face of the flared end of the tube. The shoulder on the outer sleeve and the shoulder on the inner sleeve are initially at an angle to each other, so that the extreme outer edge of the shoulder on the inner sleeve first contacts with the shoulder on the outer sleeve, and it is this shaping of the shoulders relative to each other that forcibly causes the seat on the sleeve to be brought into intimate contact with the outer face of the flared end of the tube through the yielding of the portion of the sleeve carrying said seat.

Referring more in detail to the drawing, the improved tube coupling consists of a male member 1 having a projecting portion 2 provided with a tapered seat 3. The tube to be clamped is indicated at 4. The end of the tube is flared as indicated at 5 by a suitable flaring tool. This flaring tool is so shaped as to give to the inner face of the flared end of the tube an angular positioning, substantially the same as the angle of the seat 3 against which it is to be clamped. The flaring of the end of the tube thins the tube so that it decreases in thickness from the shoulder of the flared portion to the extreme outer end of the flared portion.

The coupling includes also a female member formed in two sections. The outer section 6 is in the form of a sleeve having threads indicated at 7 which are adapted to engage the threads 8 on the male member. The female coupling also includes an inner clamping sleeve 9 which has a telescoping connection with the outer sleeve 6, and there is preferably a clearance or tolerance between the two sleeves so that the inner sleeve may be set at a slight acute angle to the longitudinal axis of the outer sleeve, and the

body portion of the coupling or the male member. The inner clamping sleeve 9 is provided with a head 10, and the inner face of the head 10 forms a tapered seat 11 adapted to engage the outer tapered face of the flared end of the tube for the forcing of the same firmly against the seat 3 on the male member 1. The tapered seat 11 is initially substantially parallel with the tapered seat 3. The line x (Fig. 4) indicates the general direction of the surface of the sleeve 9 forming the clamping seat 11. The line y indicates the general direction of the surface forming the seat 3 of the male member.

The head 10 on the inner clamping sleeve 9, as shown in Figures 3 and 4, is provided with a shoulder 12. The outer sleeve 6 is provided with an inwardly projecting portion which overlies this head 10, and on the inner face of this inwardly projecting portion is a shoulder 13. The shoulders 12 and 13 initially are at an acute angle to each other. The plane of the shoulder 12 is indicated by the line r, while the plane of the shoulder 13 is indicated by the line r'. As shown in the drawing, this line r is substantially at right angles to the longitudinal axis of the sleeve. The shoulder 12 is so positioned that the line r intersects the clamping sleeve 9 adjacent, or a short distance from the inner extreme end of the tapered seat, so that the distance from the point a to the point b is only slightly greater than the thickness of the sleeve.

The female member of the coupling is slipped on to the sleeve which is to be clamped, and the end of the tube is then flared by a suitable flaring tool. The tube is then brought into engagement with the tapered seat 3 on the male member, and the outer sleeve of the female member turned on to the male member. As has already been noted, the seats 3 and 11 are substantially parallel, while the inner and outer faces of the flared end of the tube are not parallel, due to the fact that in the flaring of the tube end, it was thinned so as to gradually decrease in thickness from the shoulder at the flare to the extreme outer end thereof. When the inner clamping section makes its initial contact with the flared end of the tube, as shown in Figures 3 and 4, the extreme edge of the shoulder 12 contacts only with the extreme outer edge of the shoulder 13. The turning of the sleeve 6 on to the male member will create a force at the extreme outer end of the shoulder 12 which tends to turn the shoulder about the point b, giving thereto a bodily movement which re-positions the seating face 11 and brings it into intimate contact with the outer face of the flared end of the tube, as shown in Fig. 5 of the drawing. It is, therefore, the yielding of the metal connecting the head portion of the clamping sleeve 9 to the body portion thereof that brings about the intimate contact between the seat 11 and the flared end of the tube, and also the intimate contact between the flared end of the tube and the seat 3 on the male member. The seating faces which were initially parallel have changed their angular position to conform to that of the inner and outer faces of the flared end of the tube, and thus there is an intimate clamping contact from the inner extremities of the seats to the outer extremities thereof. When the coupling parts are fully seated and the end of the tube is clamped, as shown in Fig. 5, the shoulder 12 on the inner clamping sleeve has shifted until it is in intimate contact with the shoulder 13. This, however, is not so essential, as it is that the seating face 11 of the clamping sleeve 9 shall make intimate contact with the tapered end of the tube throughout the entire extent of the seat.

In Fig. 2 of the drawing, the tube 4 and the sleeve 9 are shown as slightly inclined to the longitudinal axis of the body or male portion 1 of the coupling. There was sufficient tolerance between the outer sleeve 6 and the inner sleeve 9 of the female coupling member to permit this angular setting of the tube and sleeve relative to the male portion of the coupling. This does not interfere, however, with the outer sleeve 6 of the female coupling being properly threaded on to the male member, and the bringing of the shoulder 13 on said outer sleeve into contact with the shoulder 12 on the inner sleeve. When the tube is at an acute angle to the coupling parts, as shown in Fig. 2, the portion of the shoulder 13 at the right will initially contact with the shouder 12. The head 10 will yield to the clamping action which is at a maximum at one side and at a minimum at the other, so as to bring about a bodily re-positioning of the head 10 to effect a clamping of the tube end against the seat on the male coupling member. In other words, the yielding of the head may be to a greater extent at one side than at another, to take care of this angular setting of the sleeve 9 and the tube 4 which is to be clamped.

While the shoulder 13 is shown as in a line inclined to a plane at right angles to the axis of the coupling member 6, it will be understood that this shoulder may be in a plane at right angles to the longitudinal axis of the coupling member 6, and the shoulder 12 arranged in a line inclined thereto. The purpose of the shaping of these parts is to bring about the contact at the outer edge of the shoulder 12, and thus a bodily shifting of the head 10 carrying the seat 11 that is to contact with the outer face of the flared end of the tube.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

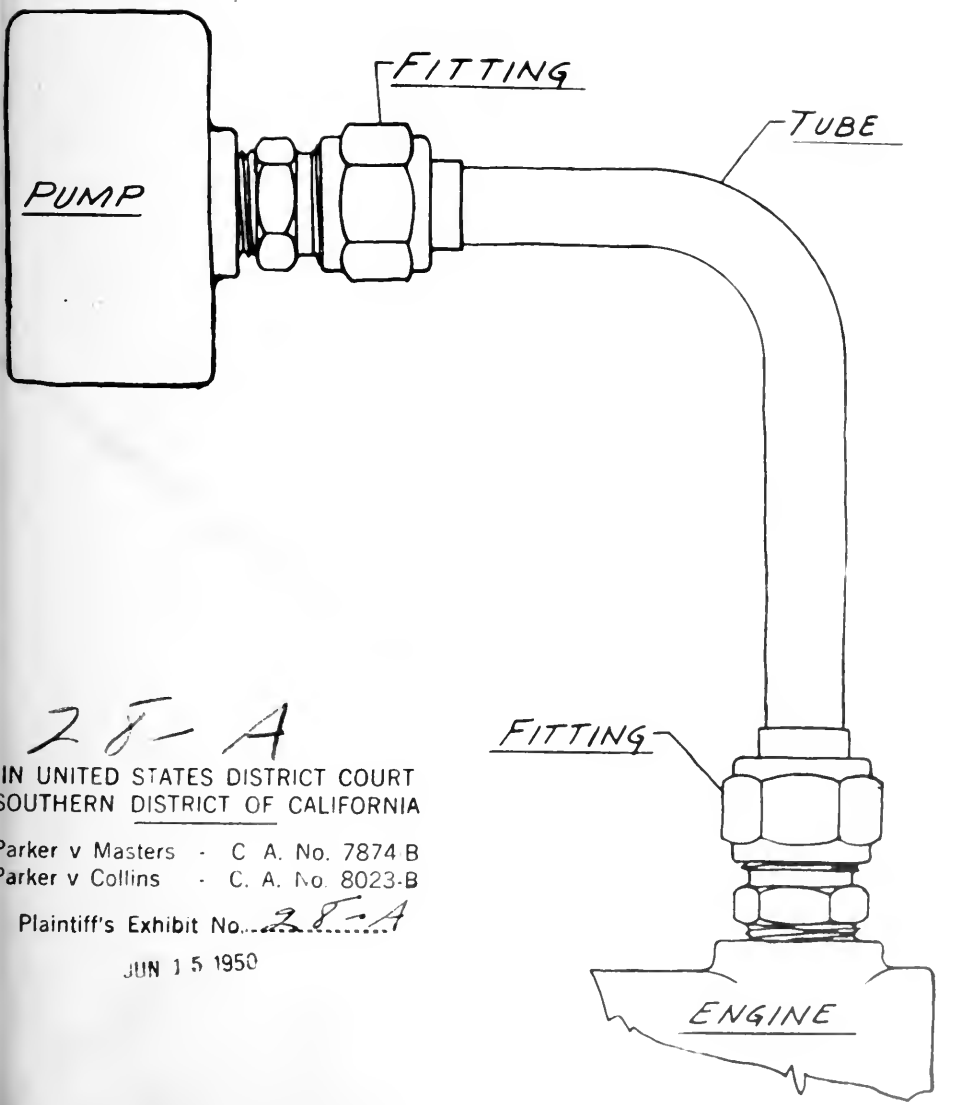
1. A tube coupling for clamping the flared end of a tube comprising a male member having a tapered seat and a female member formed with inner and outer sleeve sections, said inner sleeve section having a tapered seat at its inner end and a laterally extending shoulder, said outer sleeve section having an inwardly projecting portion adapted to overlie and contact with said shoulder, the contacting surfaces of said outer sleeve section and said shoulder being initially at an acute angle to each other so as to contact at the outer edge of the shoulder whereby when said outer sleeve section is forced against the shoulder, the inner end of the sleeve is shifted bodily so as to cause the tapered seat thereon to make intimate contact with the outer face of the flared end of the tube and clamp the inner face of the flared end of the tube firmly against the tapered seat on the male member.

2. A tube coupling for clamping the flared end of a tube comprising a male member having a tapered seat and a female member formed with inner and outer sleeve sections, said inner sleeve section having a tapered seat at its inner end

and a laterally extending shoulder, said shoulder being located adjacent the inner end of said tapered seat, said outer sleeve section having an inwardly projecting portion adapted to overlie and contact with said shoulder, the contacting surfaces of said outer sleeve section and said shoulder being initially at an acute angle to each other so as to contact at the outer edge of the shoulder whereby when said outer sleeve section is forced against the shoulder, the inner end of the sleeve is shifted bodily so as to cause the tapered seat thereon to make intimate contact with the outer face of the flared end of the tube and clamp the inner face of the flared end of the tube firmly against the tapered seat on the male member.

ARTHUR L. PARKER.

TYPICAL TUBING INSTALLATION



28-A

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 28-A

JUN 15 1950

TUBING vs PIPE

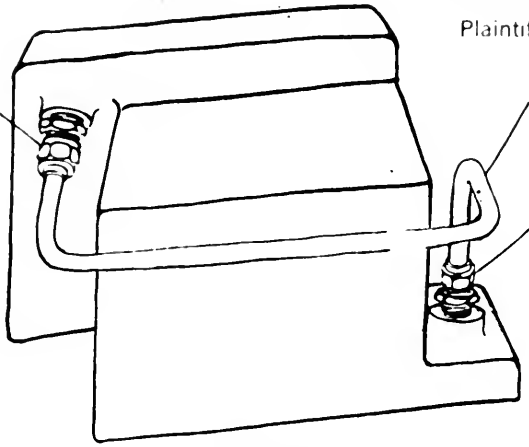


FIG. 1
TUBING INSTALLATION
TWO FITTINGS - FOUR JOINTS

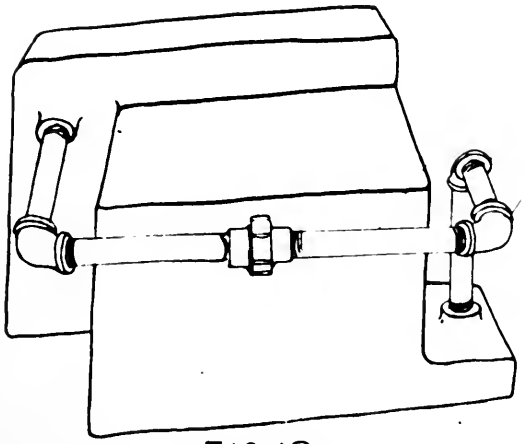
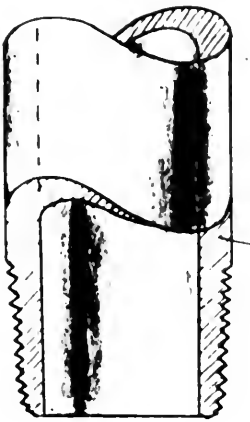


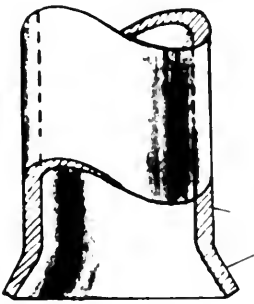
FIG. 2
PIPE INSTALLATION
FOUR FITTINGS - ELEVEN JOINTS

TUBING vs PIPE



HEAVY WALL
TO ACCOMMODATE
THREADING

FIG. 1
PIPE



THIN WALL
MAY BE FLARED

FIG. 2
TUBING

THE PARKER APPLIANCE CO CLEVELAND OHIO

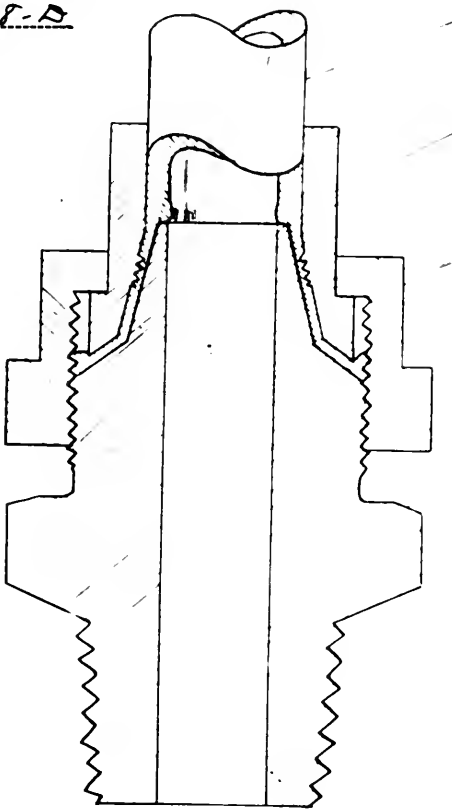
TYPICAL FITTING FOR LEAD PIPE

27-D

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

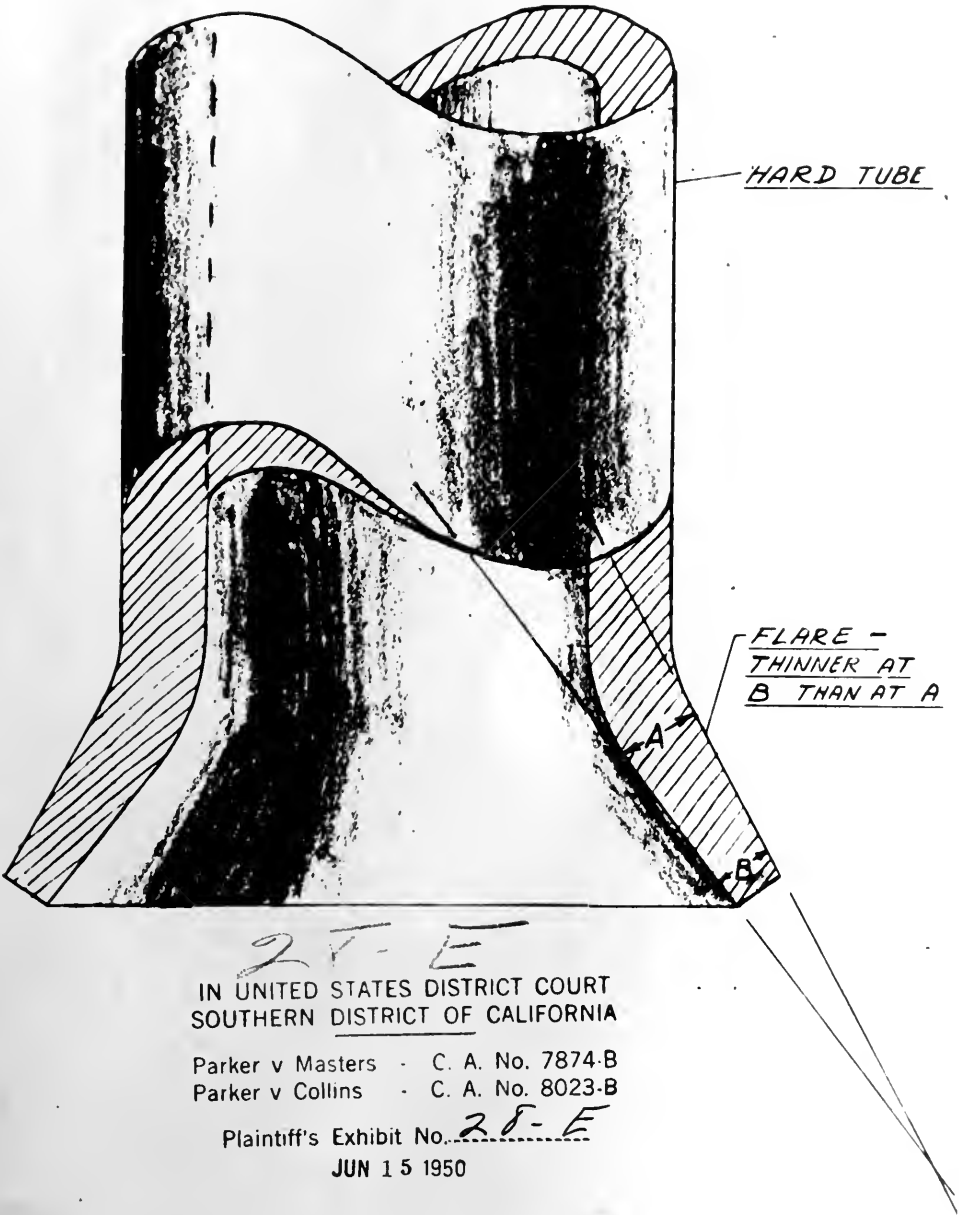
Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 28-D
JUN 15 1950



WALL THICKNESS OF FLARE THINS OUT ON HARD TUBES

1352



2 F - E

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 28-E

JUN 15 1950

TYPICAL TWO-PIECE FITTING FOR THIN WALL HARD TUBES

1353

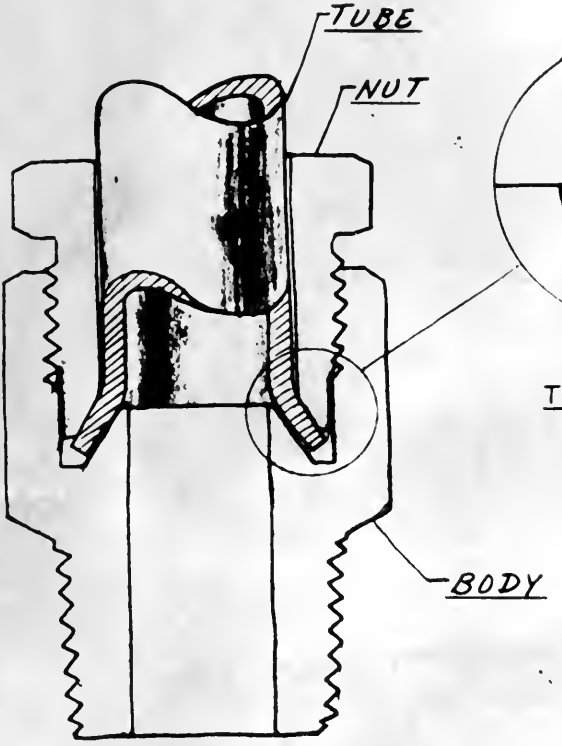


FIG. 1
LOOSE ASSEMBLY

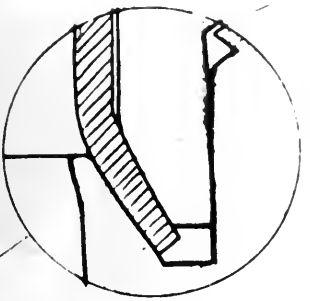


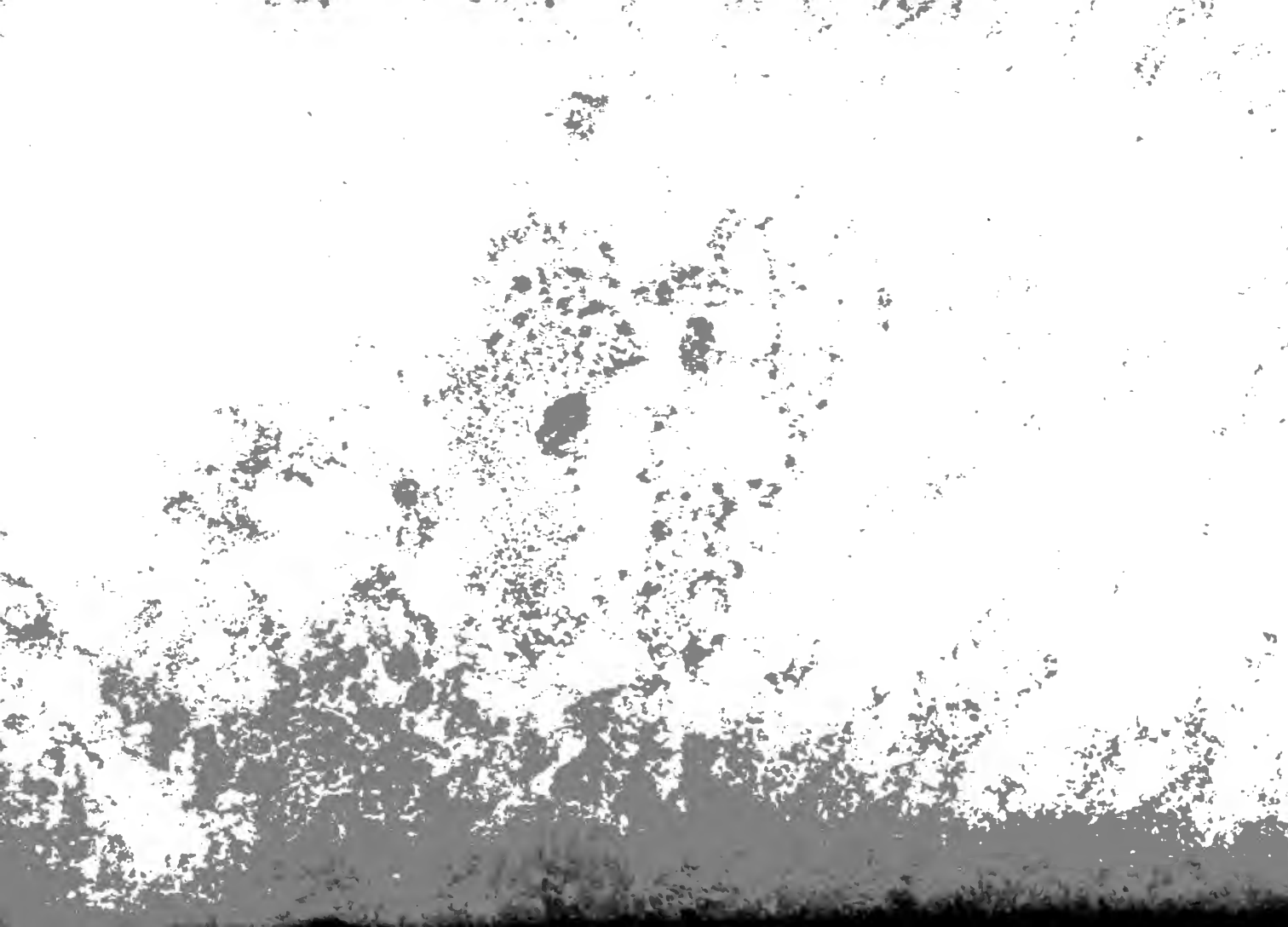
FIG. 2
TIGHT ASSEMBLY

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters · C. A. No. 7874-B
Parker v Collins · C. A. No. 8023-B

Plaintiff's Exhibit No. 38-F

JUN 15 1950



TYPICAL THREE-PIECE FITTING FOR THIN WALL HARD TUBES

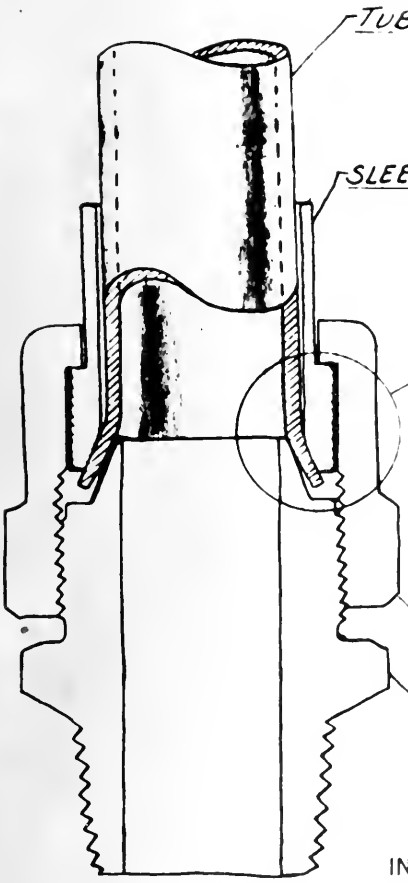


FIG. 1
LOOSE ASSEMBLY

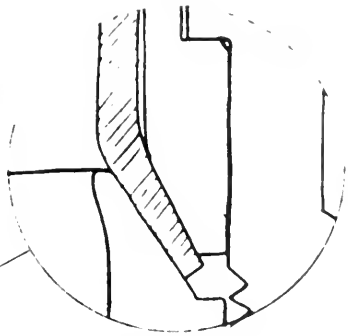


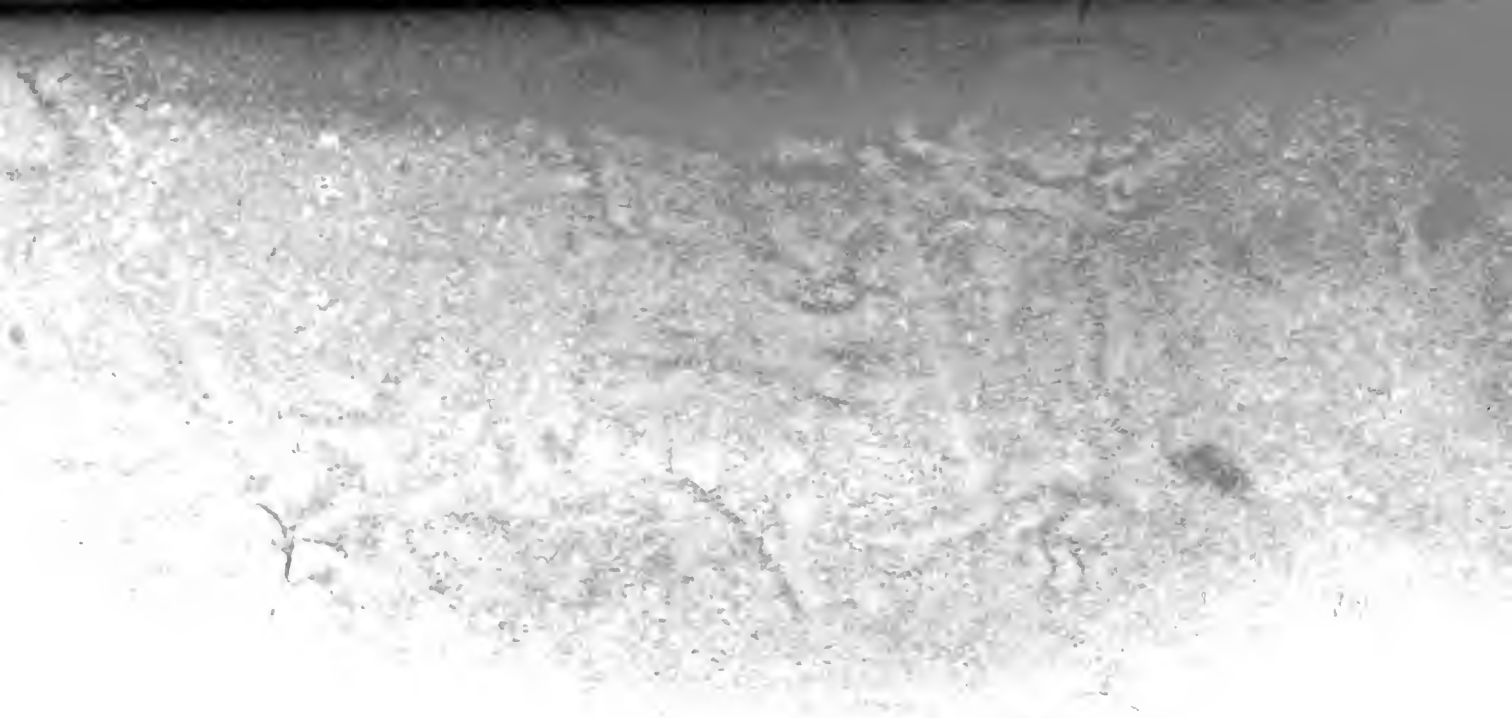
FIG 2
TIGHT ASSEMBLY

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 28-E

JUN 15 1950



1355

IMPROVED THREE-PIECE FITTING
PARKER PATENT 2212183

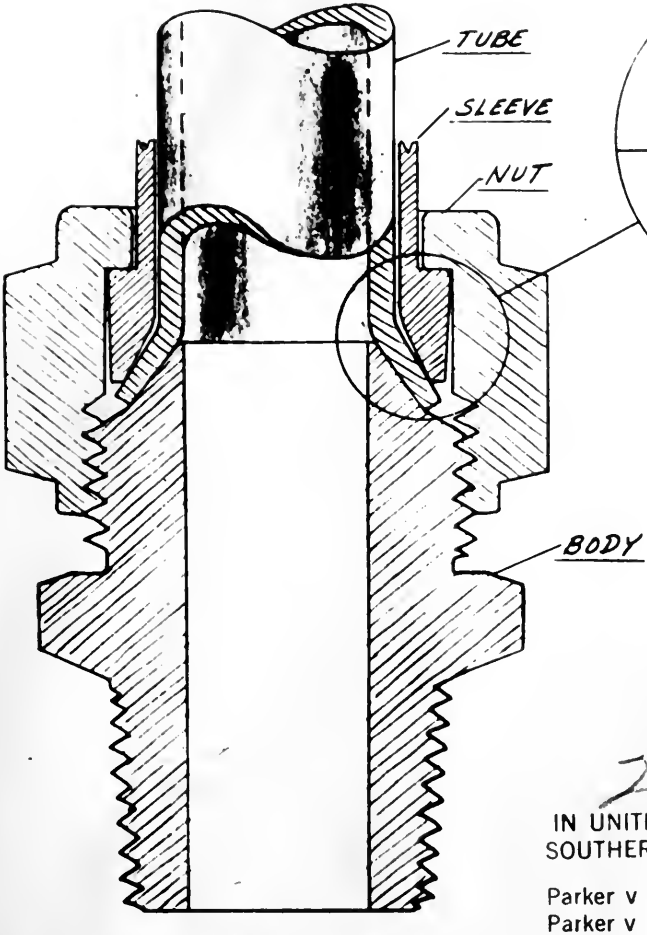


FIG. 1
LOOSE ASSEMBLY

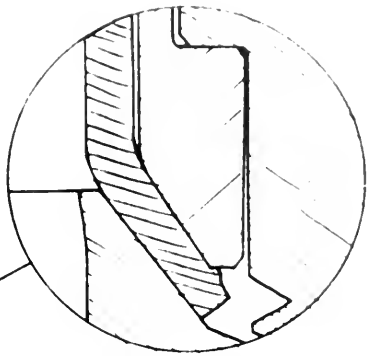


FIG. 2
TIGHT ASSEMBLY

2F-41

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

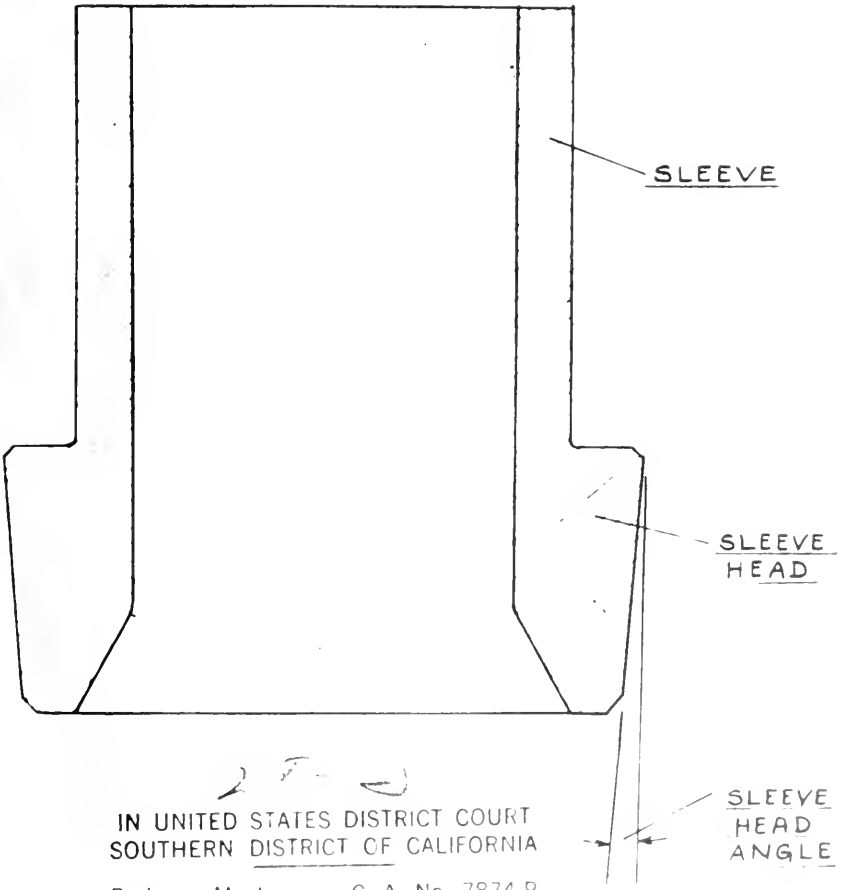
Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 28-H

JUN 15 1950

1358

SLEEVE HEAD ANGLE
PARKER PATENT 2212183



IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

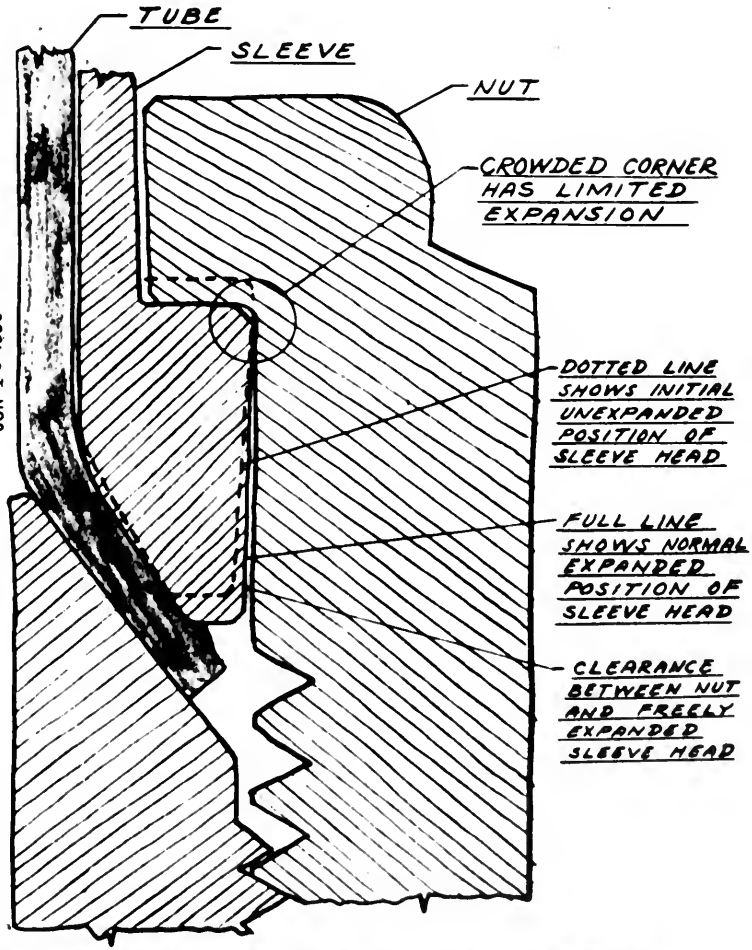
Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No 8023-B

Plaintiff's Exhibit No. 28-I

JUN 15 1950

ADVANTAGES OF SLEEVE HEAD ANGLE

PERMITS FREE EXPANSION OF SLEEVE HEAD



SLEEVE HEAD ANGLE PROVIDES ENOUGH CLEARANCE BETWEEN NUT AND LOWER END OF SLEEVE HEAD TO PERMIT FREE EXPANSION OF LATTER UNDER NORMAL WRENCH TORQUES WITHOUT CONTACTING NUT WALL

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

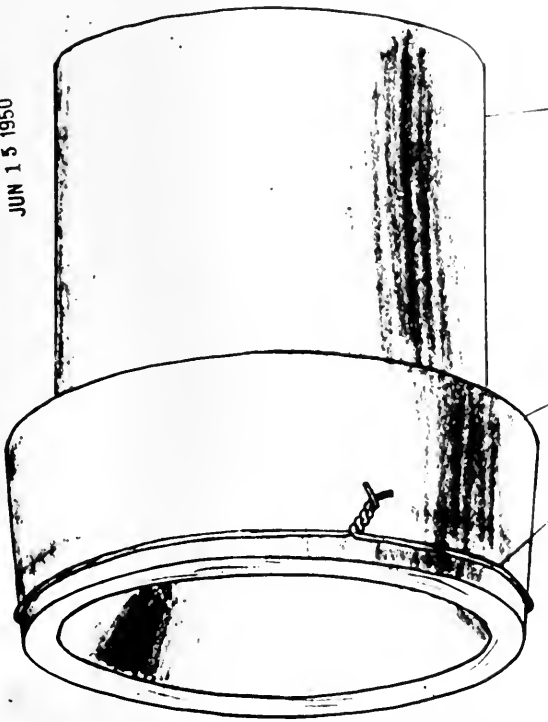
Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 24-J
JUN 15 1950

24-J

ADVANTAGES OF SLEEVE HEAD ANGLE

EXPANSION OF SLEEVE HEAD PROVIDES HOOP TENSION

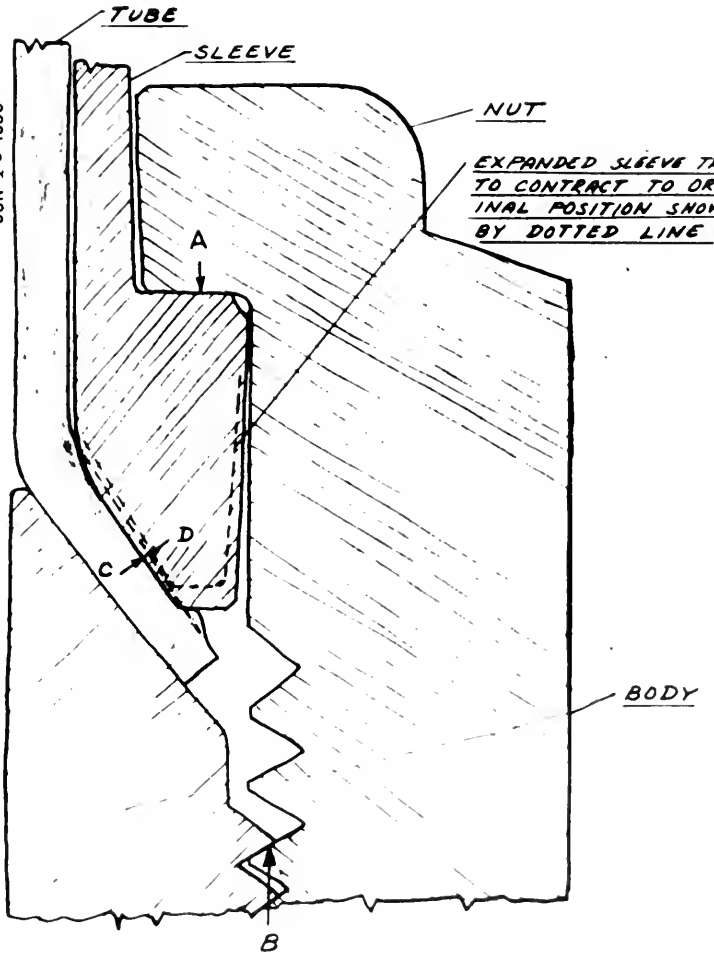


THE SLEEVE HEAD, AS IT EXPANDS, IS PUT UNDER TENSION STRESS WHICH TENDS TO CONTRACT THE SLEEVE HEAD TO ITS ORIGINAL SIZE. THIS STRESS, BEING EXERTED IN A CIRCLE, IS REFERRED TO AS "HOOP TENSION".

THE PARKER APPLIANCE CO. CLEVELAND, OHIO

ADVANTAGES OF SLEEVE HEAD ANGLE

HOOP TENSION LOCKS NUT AGAINST LOOSENING



HOOP TENSION IN THE SLEEVE HEAD ACTS LIKE A LOCK WASHER TO PREVENT ACCIDENTAL LOOSENING OF THE NUT BY VIBRATION

THE PARKER APPLIANCE CO. CLEVELAND OHIO

ADVANTAGES OF SLEEVE HEAD ANGLE

FREE EXPANSION CORRECTS OUT-OF-ROUND SLEEVES

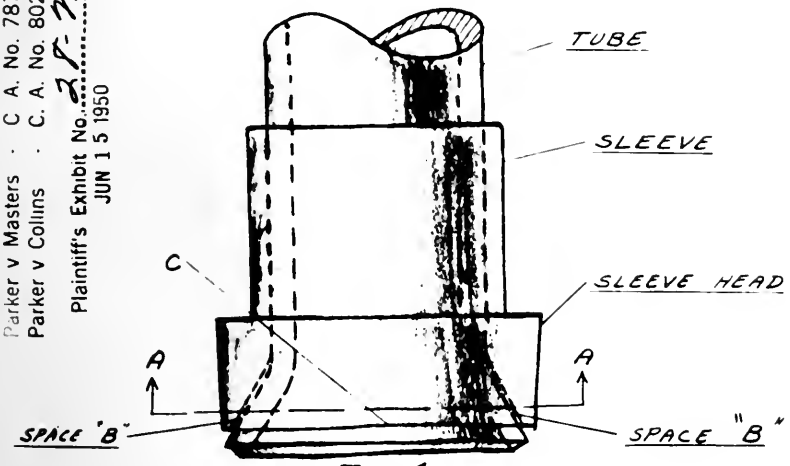


FIG. 1

INTERNAL STRESSES IN THE METAL MAY CAUSE THE SLEEVE TO SPRING SLIGHTLY OVAL DURING MANUFACTURE AND CAUSE INITIAL CONTACT WITH FLARE AT POINTS "C" BUT NOT AT POINTS "B".

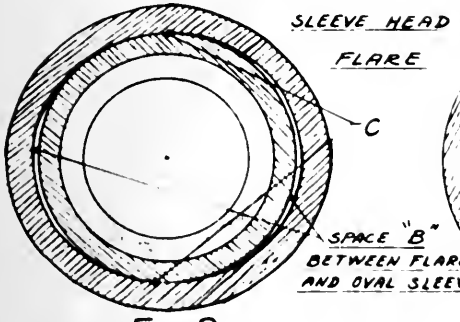


FIG. 2

SECTION A-A OF FIG. 1 BEFORE TIGHTENING

UNEXPANDED SLEEVE HEAD IS OVAL AND DOES NOT SEAT ON FLARE AT POINTS "B"

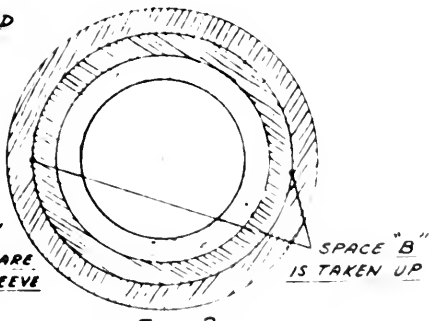


FIG. 3

SECTION A-A OF FIG 1 AFTER TIGHTENING

EXPANDED SLEEVE HEAD IS ROUND AND SEATS ON FLARE AT ALL POINTS.

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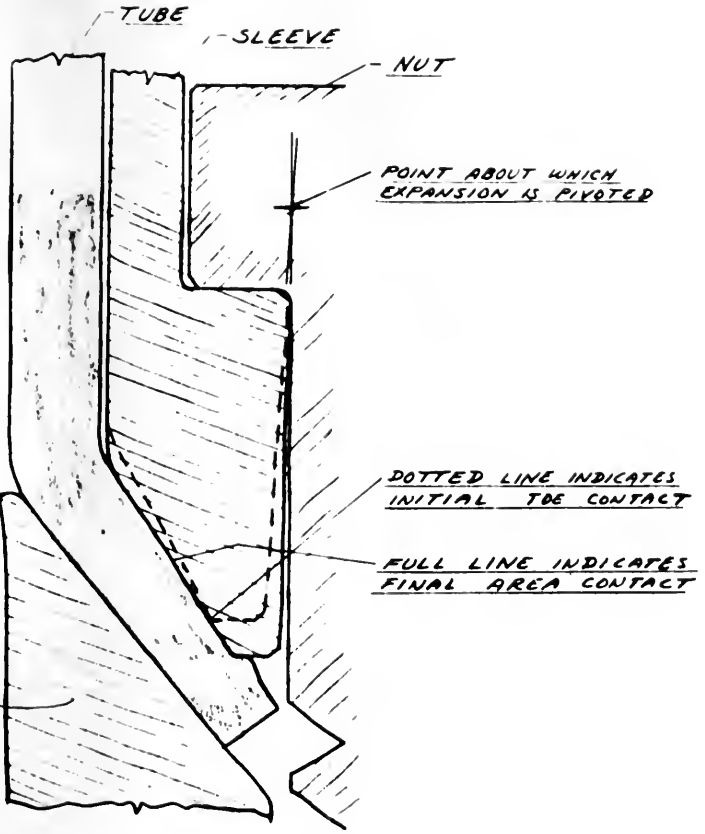
ADVANTAGES OF SLEEVE HEAD ANGLE EXPANSION CONVERTS TOE CONTACT TO AREA CONTACT



EXPANSION OF THE SLEEVE HEAD IS GREATER AT THE LOWER END THAN AT THE UPPER END THEREFORE THE SLEEVE HEAD CROSS SECTION PIVOTS AND CAUSES THE INITIAL TOE CONTACT WITH THE FLARE TO BECOME AREA CONTACT

IN UNITED STATES DISTRICT COURT
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ADVANTAGES OF SLEEVE HEAD ANGLE
EXPANSION MAKES AMOUNT OF NUT TURNING LESS CRITICAL

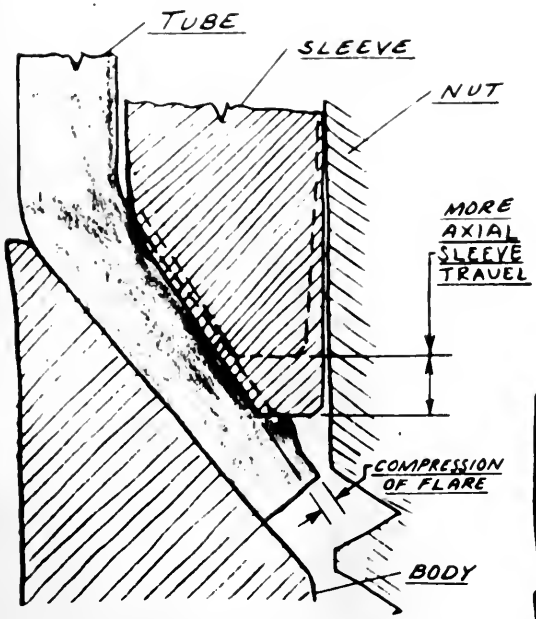

FIG. 1

EXPANDED SLEEVE

EXPANSION OF SLEEVE HEAD PERMITS MORE AXIAL TRAVEL OF SLEEVE WHILE COMPRESSING THE FLARE A GIVEN AMOUNT. AXIAL SLEEVE TRAVEL IS PROPORTIONAL TO THE AMOUNT THAT THE NUT IS TURNED, THEREFORE THERE IS GREATER LATITUDE IN HOW MUCH THE NUT MAY BE TURNED BEFORE EXCESSIVE COMPRESSION OF THE FLARE OCCURS

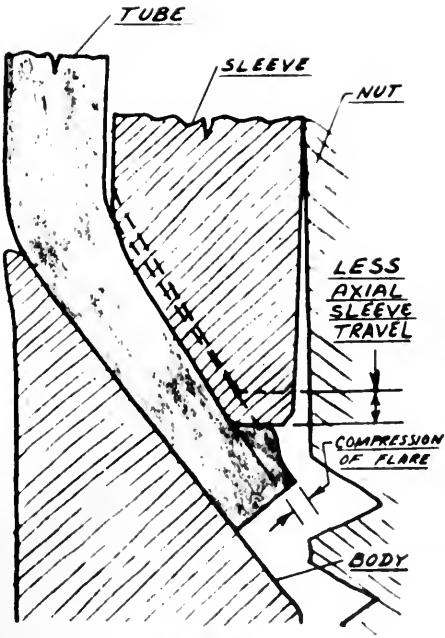

FIG. 2

UNEXPANDED SLEEVE

UNEXPANDED SLEEVE HEAD RESULTS IN LESS AXIAL TRAVEL AND THEREFORE LESS LATITUDE IN AMOUNT WHICH NUT MAY BE TURNED BEFORE FLARE IS EXCESSIVELY COMPRESSED.

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IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

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Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 28-O

JUN 15 1950

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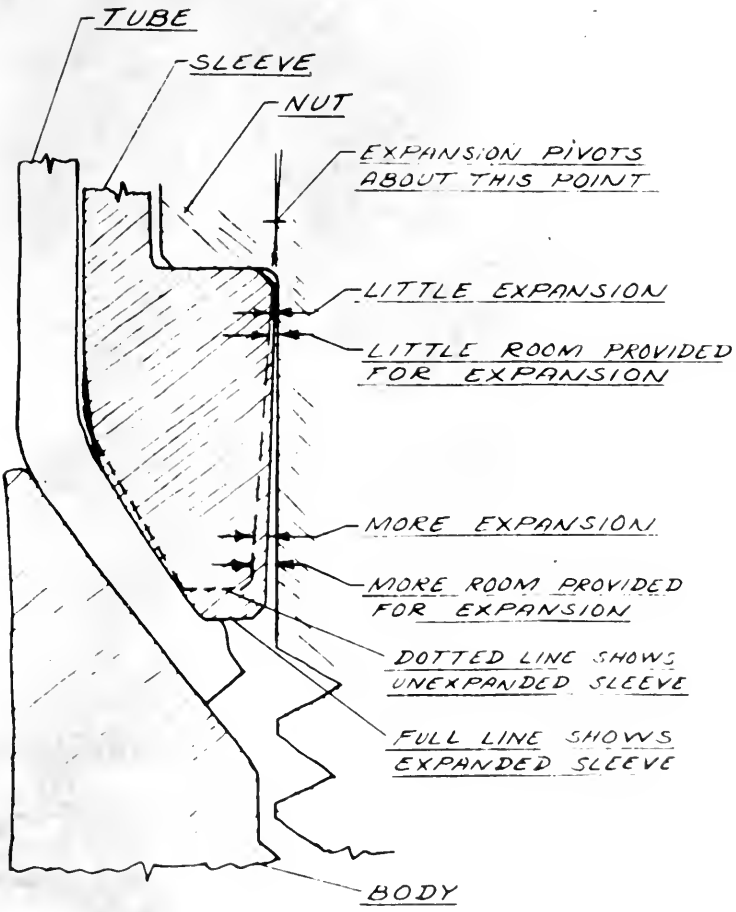
ADVANTAGES OF SLEEVE HEAD ANGLE

ANGLE PROVIDES MORE ROOM FOR EXPANSION WHERE EXPANSION IS GREATEST

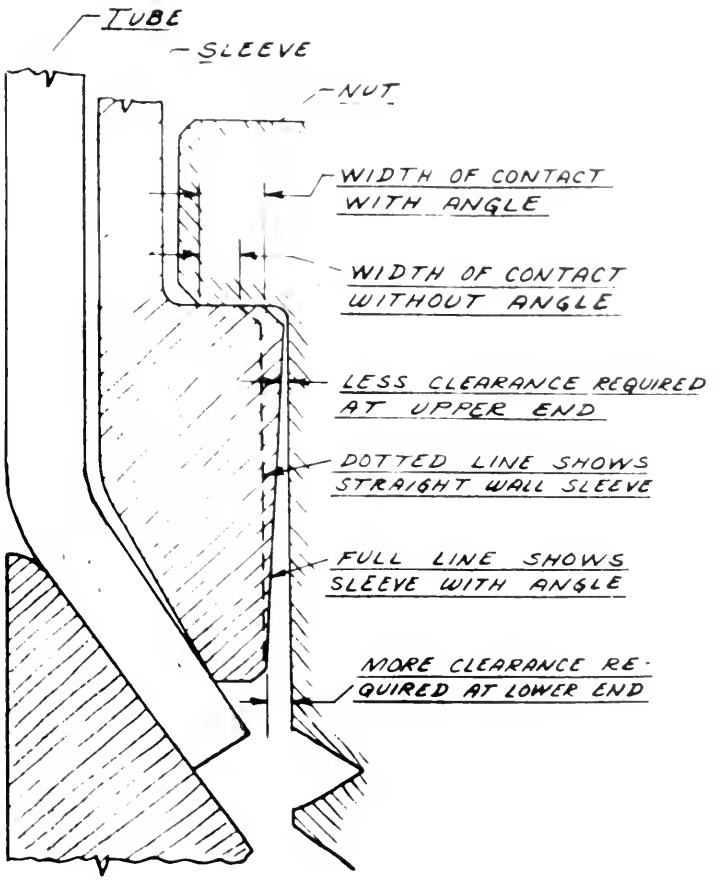


THE SLEEVE HEAD ANGLE ACCOMMODATES THE GREATER EXPANSION OF THE LOWER END OF THE SLEEVE AS COMPARED TO THE UPPER END

1363

ADVANTAGES OF SLEEVE HEAD ANGLE

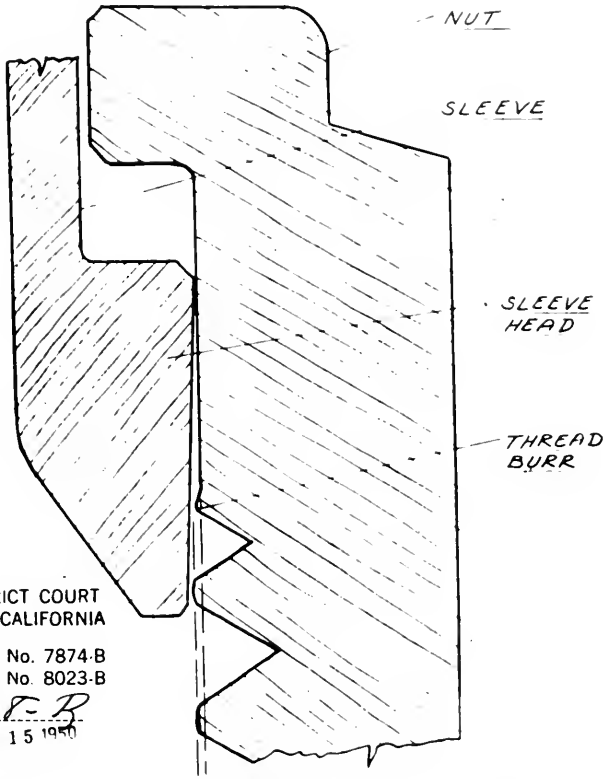
ANGLE PERMITS MAXIMUM SHOULDER CONTACT



A SLEEVE WITH AN ANGLE ON THE HEAD PROVIDES MORE SHOULDER CONTACT AREA BETWEEN SLEEVE AND NUT WITH SAME SIDE CLEARANCE AT LOWER END OF SLEEVE HEAD THAN A STRAIGHT WALL SLEEVE

THE PARKER APPLIANCE CO. CLEVELAND, OHIO

ADVANTAGES OF SLEEVE HEAD ANGLE
ANGLE FACILITATES DISASSEMBLY OF SLEEVE FROM NUT



IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

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SLEEVE HEAD ANGLE FACILITATES DISASSEMBLY OF OVERTIGHTENED SLEEVES FROM THE NUT BY PERMITTING SLEEVE HEAD TO GET STARTED PAST THREAD BURRS

ADVANTAGES OF SLEEVE HEAD ANGLE
ANGLE PROVIDES ADDITIONAL CLEARANCE TO AVOID LOCKING OF SLEEVE TO NUT

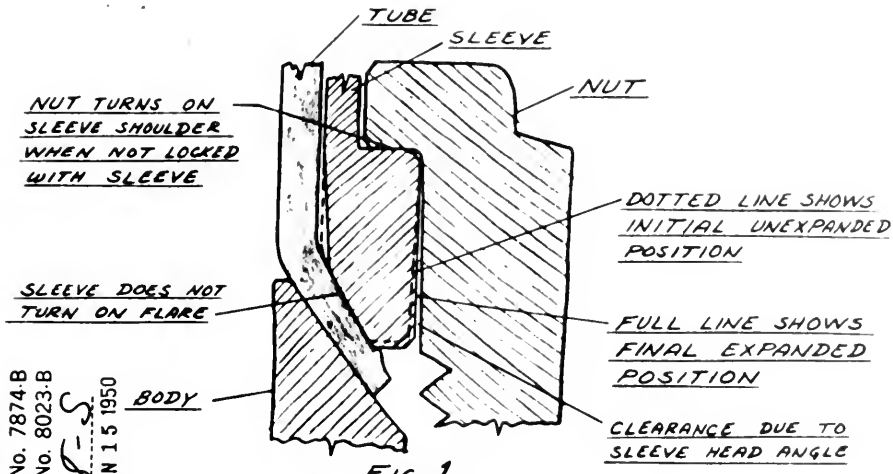


FIG. 1
SLEEVE WITH ANGLE

SLEEVE HEAD ANGLE PROVIDES ADDITIONAL CLEARANCE TO ACCOMMODATE EXPANSION WITHOUT HAVING THE SLEEVE LOCK AGAINST THE SIDE WALL OF THE NUT.

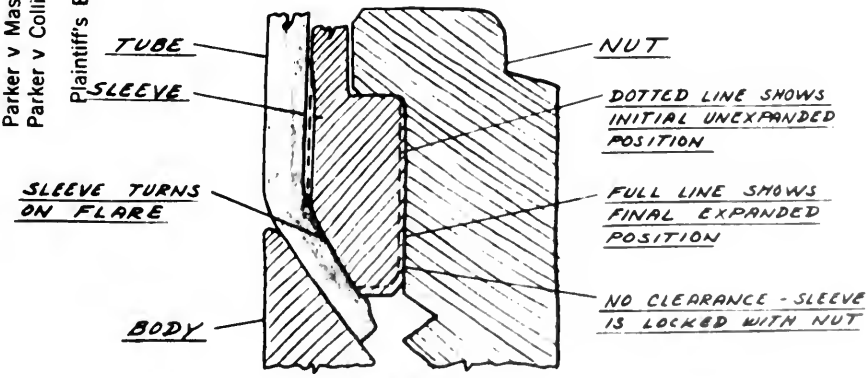


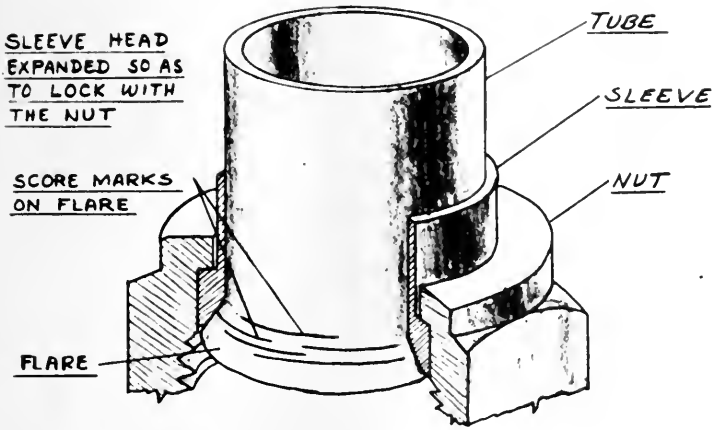
FIG. 2
SLEEVE WITHOUT ANGLE

WHEN SLEEVE HEAD HAS NO ANGLE THERE IS INSUFFICIENT CLEARANCE TO ACCOMMODATE EXPANSION AND SLEEVE LOCKS IN NUT

THE PARKER APPLIANCE CO. CLEVELAND, OHIO

ADVANTAGES OF SLEEVE HEAD ANGLE

ANGLE PREVENTS SCORING OF FLARE



IF SLEEVE HEAD EXPANDS SO AS TO LOCK IN NUT, THE SLEEVE WILL TURN WITH THE NUT AND THUS TURN ON THE FLARE. THIS PRODUCES SCORE MARKS ON THE FLARE WHICH MAY CAUSE FLARE FRACTURES. THE SLEEVE HEAD ANGLE ACCOMMODATES EXPANSION WITHOUT LOCKING AND THUS AVOIDS SCORING OF THE FLARE.

IN UNITED STATES DISTRICT COURT
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ADVANTAGES OF SLEEVE HEAD ANGLE

ANGLE PREVENTS TWISTING OF TUBE

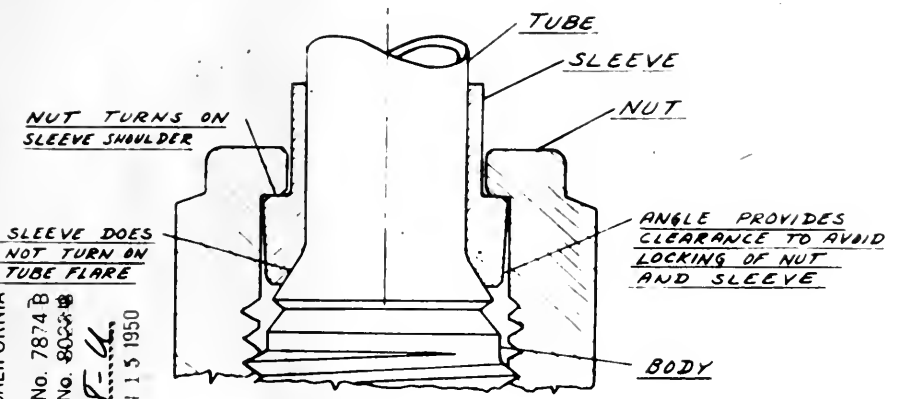


FIG. 1

WHEN SLEEVE AND NUT ARE NOT LOCKED THE SLEEVE AND TUBE DO NOT TURN WITH THE NUT AND THE TUBE IS NOT SUBJECTED TO TORSIONAL STRESS

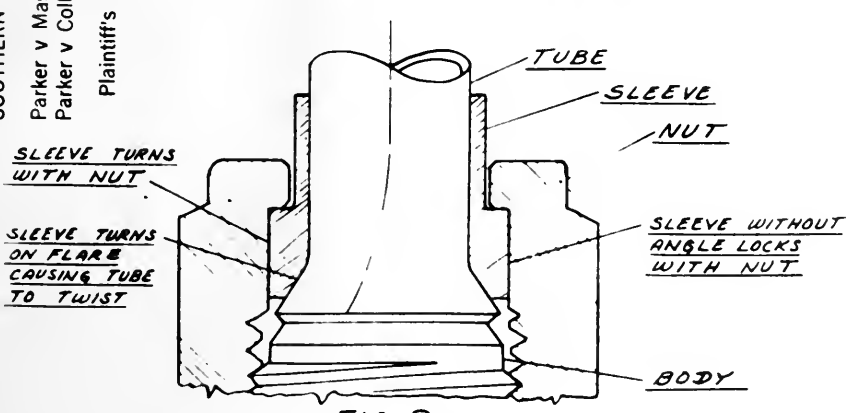


FIG. 2

WHEN SLEEVE AND NUT ARE LOCKED THE SLEEVE TURNS WITH THE NUT AND SUBJECTS THE TUBE TO TORSIONAL STRESS

ADVANTAGES OF SLEEVE HEAD ANGLE
ANGLE FACILITATES DISASSEMBLY OF BENT TUBES

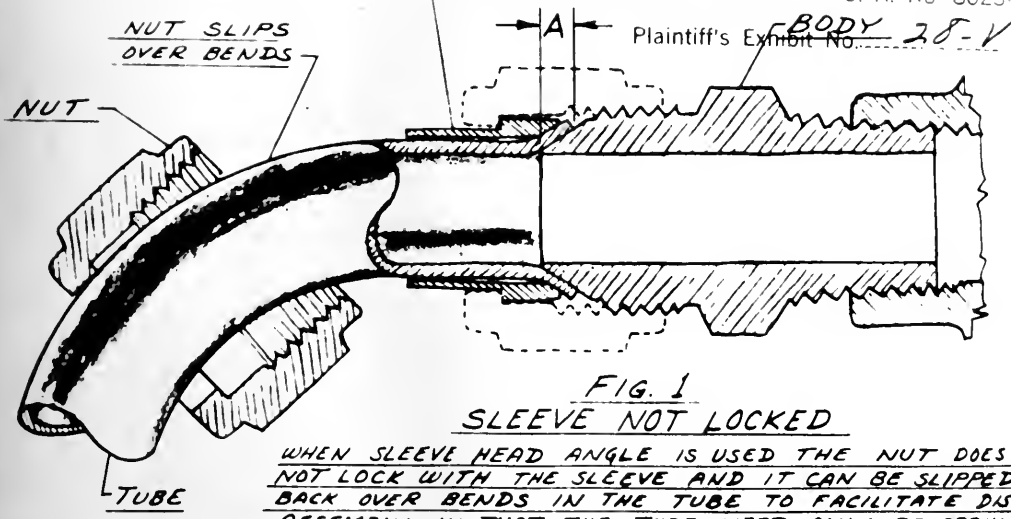


FIG. 1
SLEEVE NOT LOCKED

WHEN SLEEVE HEAD ANGLE IS USED THE NUT DOES NOT LOCK WITH THE SLEEVE AND IT CAN BE SLIPPED BACK OVER BENDS IN THE TUBE TO FACILITATE DISASSEMBLY IN THAT THE TUBE NEED ONLY BE SPRUNG THE DISTANCE "A" TO CLEAR THE COUPLING BODY

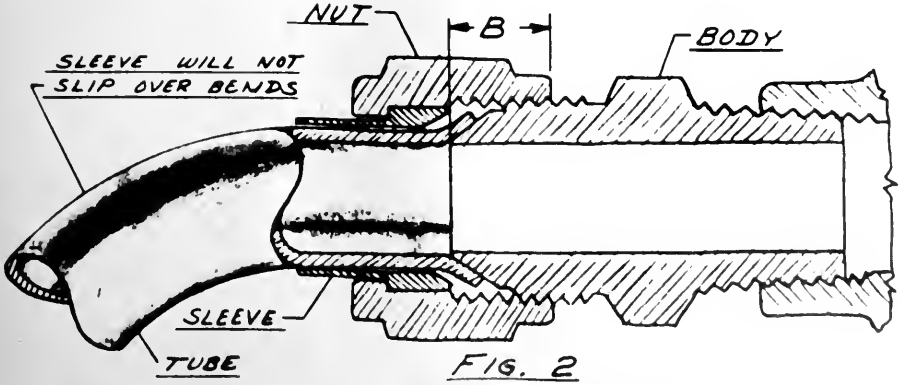


FIG. 2
SLEEVE LOCKED

WHEN SLEEVE HEAD ANGLE IS OMITTED THE NUT LOCKS WITH THE SLEEVE AND CANNOT BE SLIPPED BACK OVER ADJACENT BENDS AND THE TUBE MUST BE SPRUNG THE DISTANCE "B" TO CLEAR THE COUPLING BODY.

ADVANTAGES OF SLEEVE HEAD ANGLE

ANGLE FACILITATES DISASSEMBLY OF DAMAGED AND TAGGED TUBES

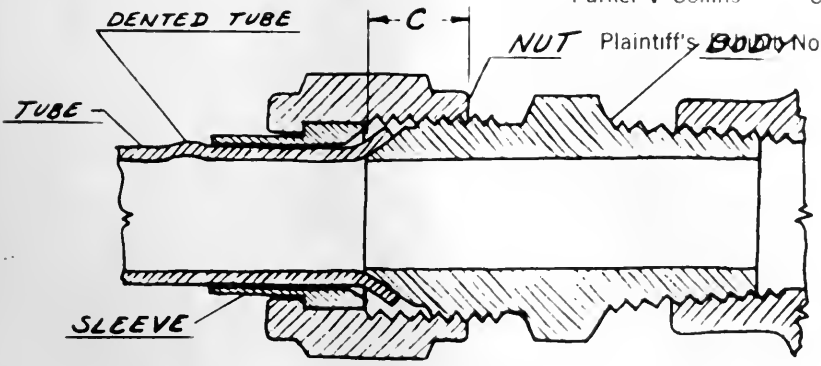


FIG 1

DAMAGED TUBES

WHEN NUT IS LOCKED TO SLEEVE IT CANNOT BE SLIPPED BACK OVER DENTS OR DEFECTS AND THE TUBE MUST BE SPRUNG THE DISTANCE "C" TO DISASSEMBLE.

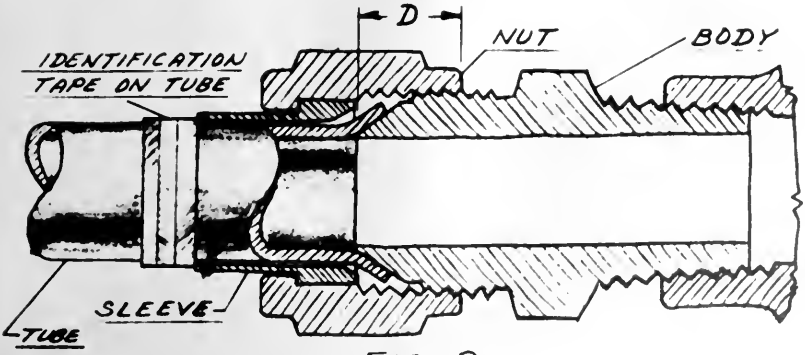
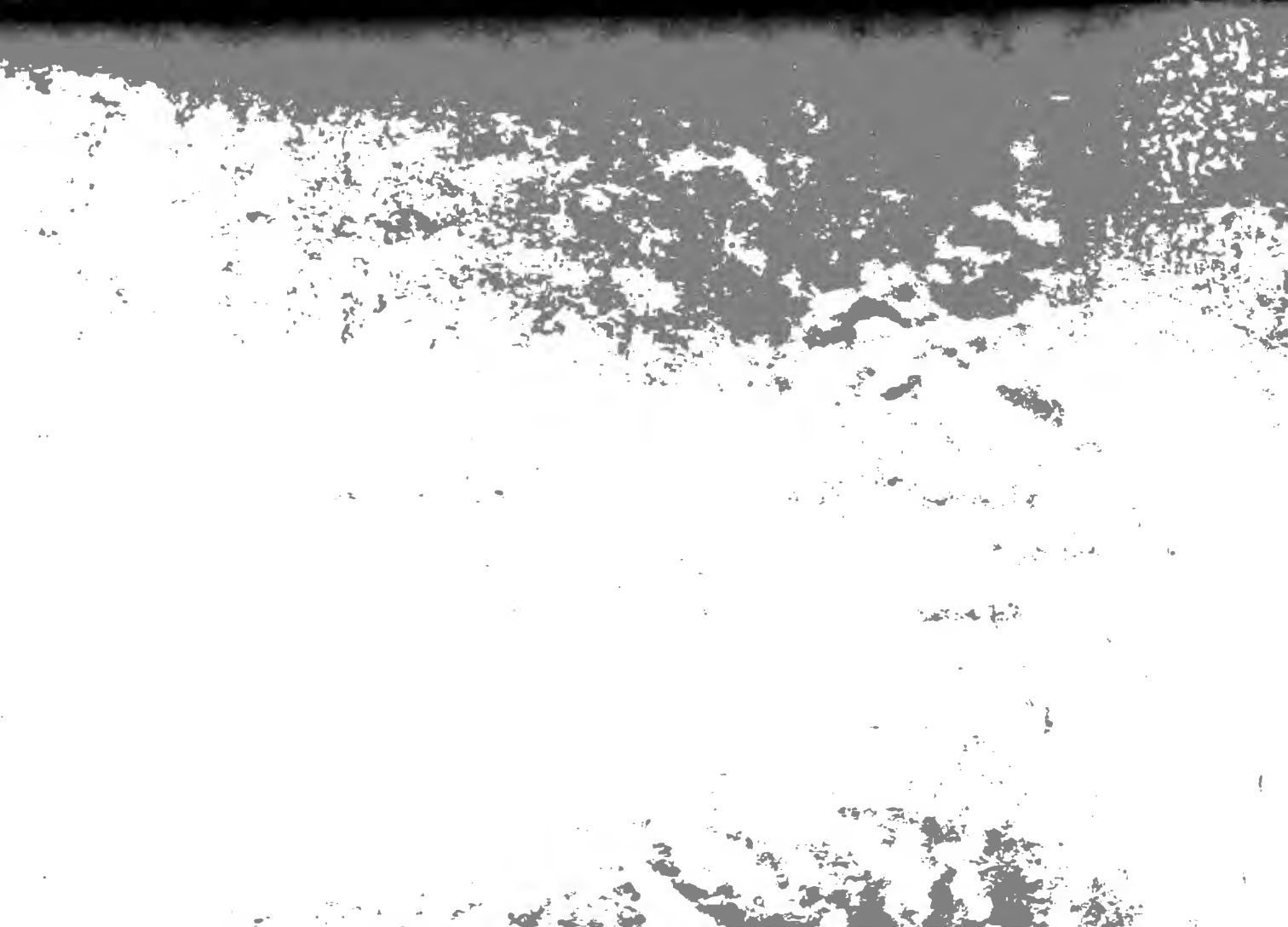


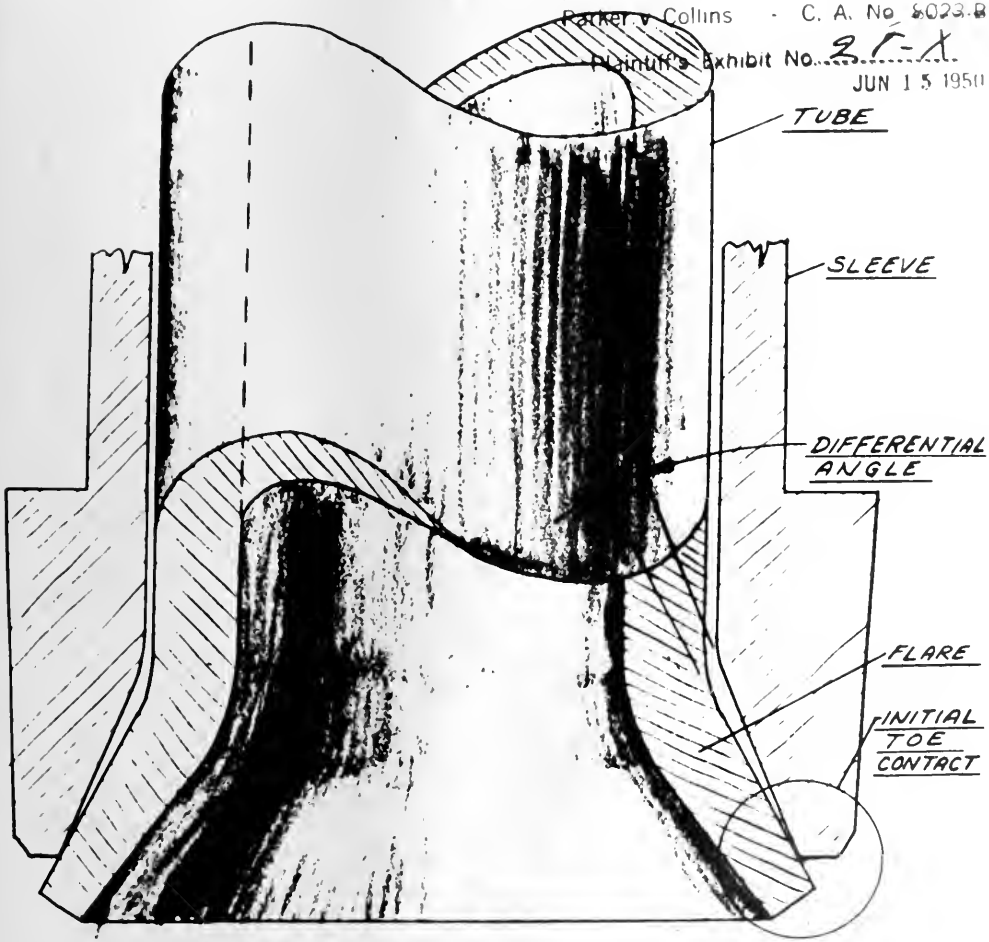
FIG 2

TAGGED TUBES

WHEN NUT IS LOCKED TO SLEEVE IT CANNOT BE SLIPPED BACK OVER IDENTIFICATION TAPES AND TUBE MUST BE SPRUNG DISTANCE "D" TO DISASSEMBLE.



DIFFERENTIAL ANGLE
PARKER PATENT 2212183



DIFFERENTIAL ANGLE BETWEEN SLEEVE AND FLARE PROVIDES INITIAL TOE CONTACT AT LOWER END OF SLEEVE

ADVANTAGES OF DIFFERENTIAL ANGLE TOE CONTACT FACILITATES FORMATION OF HOLDING NUB

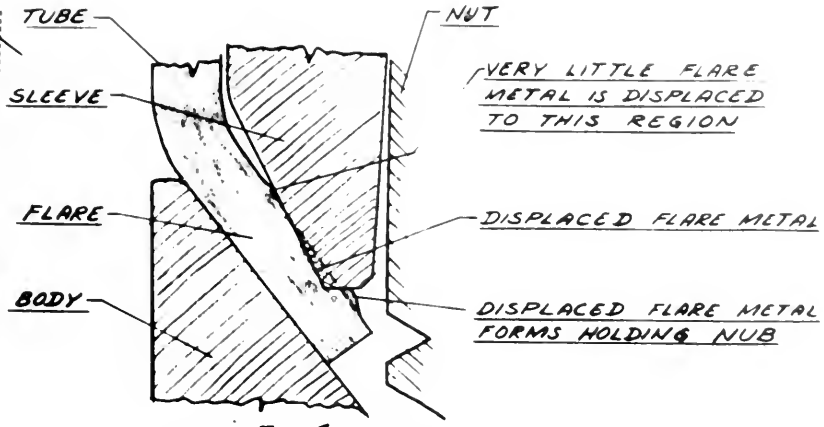


FIG. 1

INITIAL TOE CONTACT

TOE CONTACT UTILIZES MINIMUM FLARE METAL DISPLACEMENT AND HENCE MINIMUM WRENCH TORQUE TO FORM HOLDING NUB

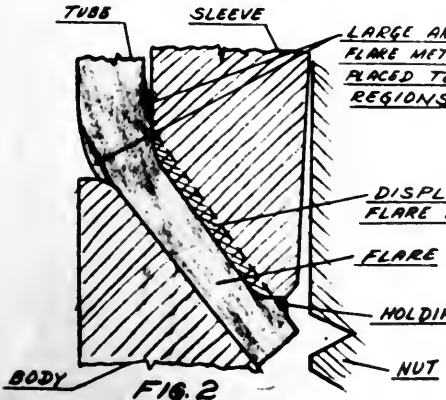


FIG. 2

INITIAL FULL CONTACT

UTILIZES LESS DISPLACED FLARE METAL HENCE REQUIRES MORE WRENCH TORQUE TO FORM NUB

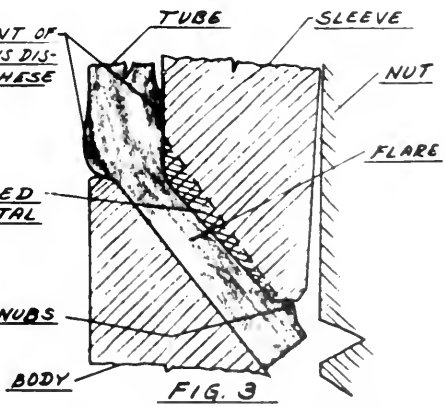


FIG. 3

INITIAL HEEL CONTACT

UTILIZES A MINIMUM OF DISPLACED FLARE METAL HENCE REQUIRES MAXIMUM TORQUE TO FORM NUB

ADVANTAGES OF DIFFERENTIAL ANGLE

TOE CONTACT TENDS TO PRODUCE LINE TYPE SEAL

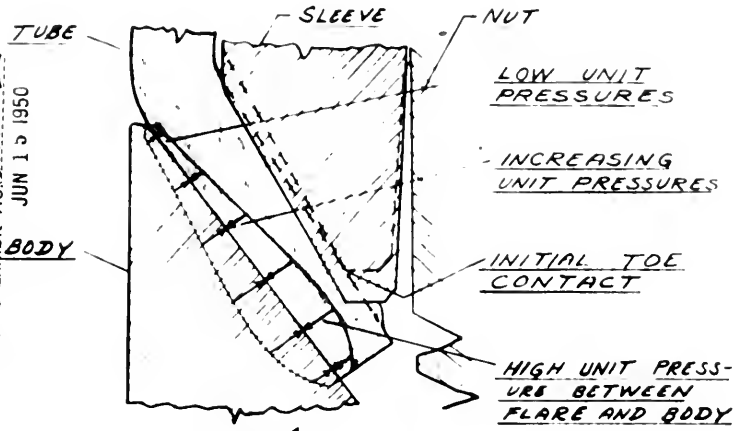


FIG. 1
INITIAL TOE CONTACT

AFFORDS APPROACH TO LINE TYPE SEAL BY CONCENTRATING SEALING PRESSURE IN REGION OF INITIAL TOE CONTACT

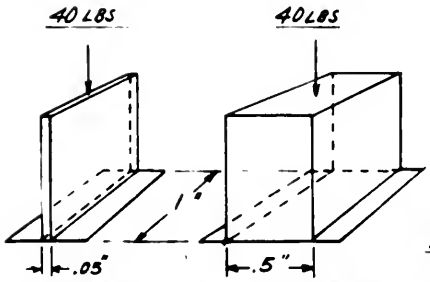


FIG. 2
LINE SEAL
HAS HIGH UNIT PRESSURE

AREA = .05 x 1
= .05 SQ. IN.

UNIT PRESS. = $\frac{40 \text{ LBS.}}{.05 \text{ SQ. IN.}}$
= 800 LBS/SQ. IN.

FIG. 3
AREA SEAL
HAS LOW UNIT PRESSURE

AREA = .5 x 1
= .5 SQ. IN.

UNIT PRESS. = $\frac{40 \text{ LBS}}{.5 \text{ SQ. IN.}}$
= 80 LBS/SQ. IN

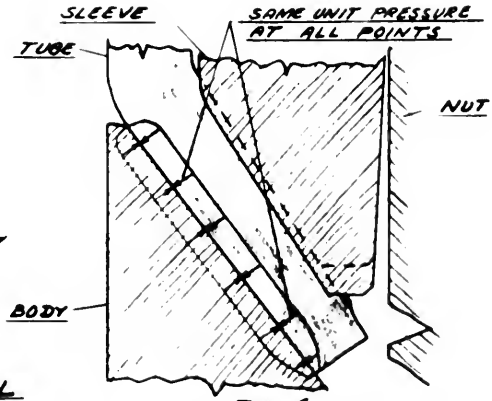
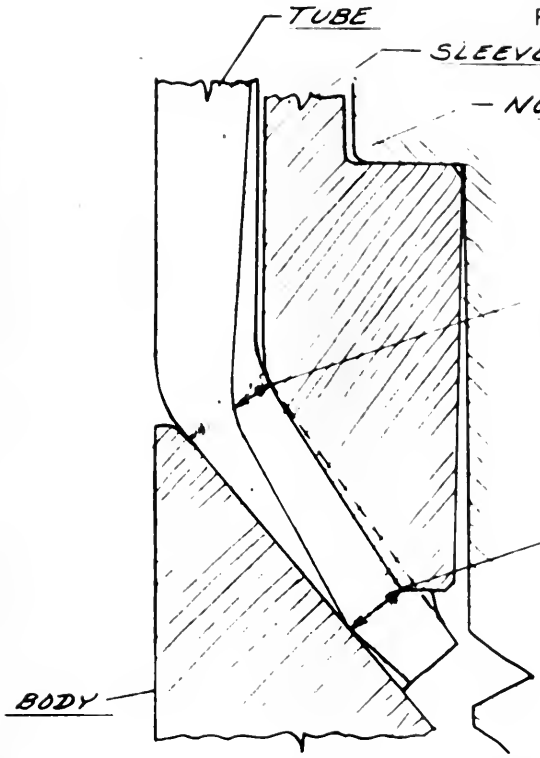


FIG. 4
INITIAL AREA CONTACT
AFFORDS AREA TYPE SEAL

ADVANTAGES OF DIFFERENTIAL ANGLE

TOE CONTACT RESISTS VIBRATION FAILURE



INITIAL TOE CONTACT INCREASES RESISTANCE TO BREAKING OF THE TUBE DUE TO VIBRATION FATIGUE BY CONCENTRATING MOST OF THE CLAMPING STRESS AT THE TOE OF THE FLARE WITH A GRADUALLY DECREASING STRESS TOWARD THE HEEL WHERE VIBRATION STRESSES CONCENTRATE

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ADVANTAGES OF DIFFERENTIAL ANGLE TOE CONTACT COMPENSATES FOR MISALIGNED FLARES

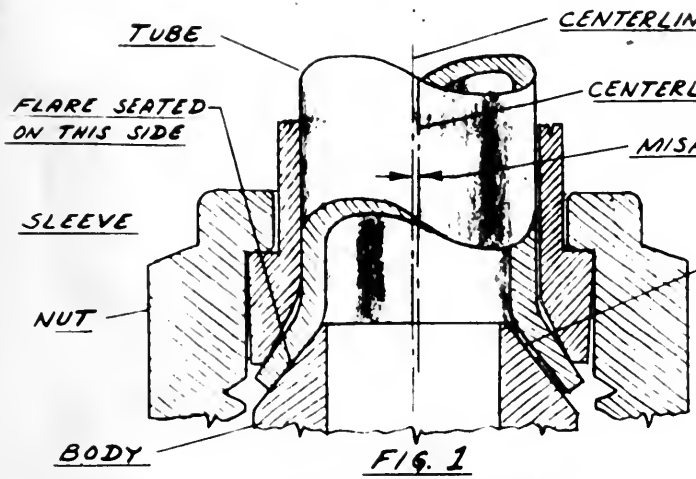

FIG. 1

LOOSE ASSEMBLY

TUBE FLARE NOT ALIGNED WITH BODY SEAT AND SEATS ON ONE SIDE BUT NOT ON OTHER

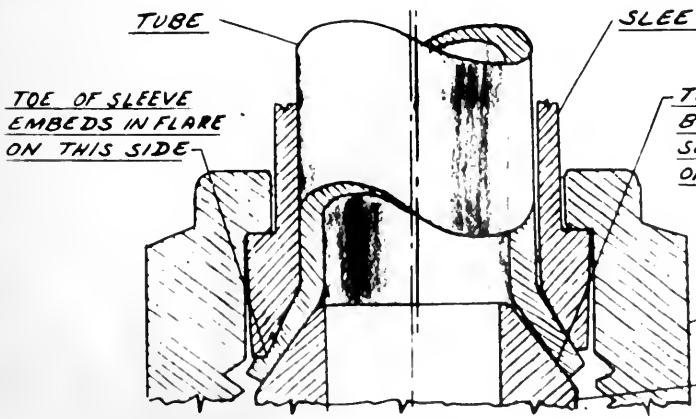

FIG. 2

TIGHT ASSEMBLY

TOE CONTACT PERMITS SLEEVE TO EMBED IN FLARE ON SIDE INITIALLY IN CONTACT WITH BODY AND FACILITATES BENDING OF OTHER SIDE INTO CONTACT

THE PARKER APPLIANCE CO CLEVELAND, OHIO

ADVANTAGES OF DIFFERENTIAL ANGLE

TOE CONTACT AVOIDS WEAKENING OF THE FLARE AT ITS BASE

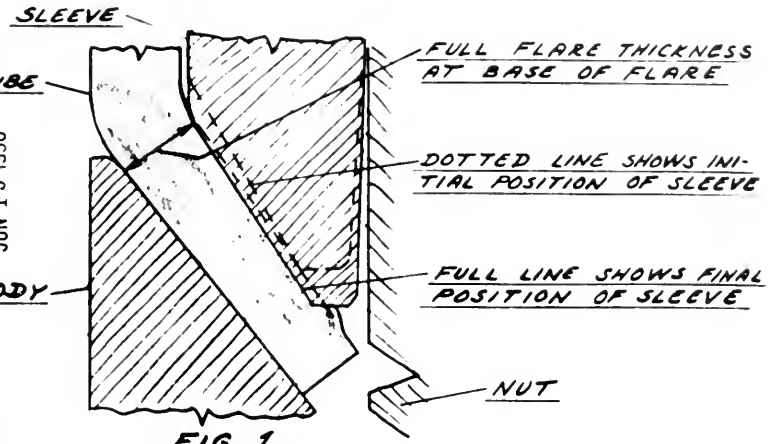

FIG. 1

INITIAL TOE CONTACT

FLARE IS NOT THINNED AT ITS BASE AND RETAINS ITS FULL MECHANICAL STRENGTH

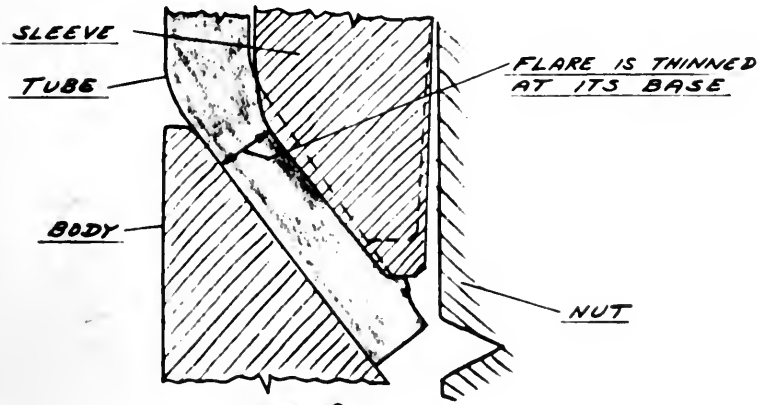

FIG. 2

INITIAL FULL CONTACT

FLARE IS THINNED AND MECHANICALLY WEAKENED AT ITS BASE

PARKER APPLIANCE CO CLEVELAND, OHIO

ADVANTAGES OF DIFFERENTIAL ANGLE TOE CONTACT FACILITATES EXPANSION OF SLEEVE HEAD

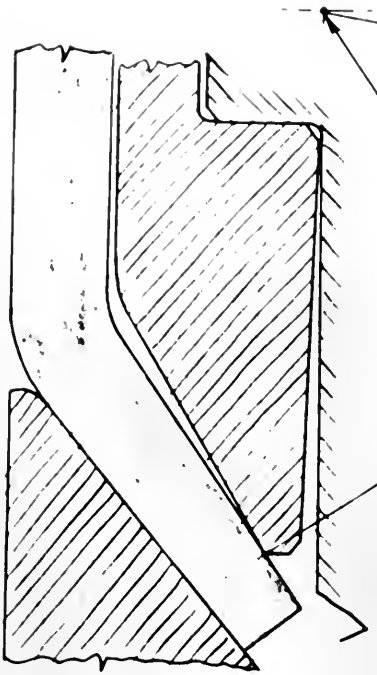

FIG. 1
INITIAL TOE CONTACT
RESULTS IN READY EXPANSION AT LOW WRENCH TORQUE BUT EVENTUAL FULL CONTACT RESISTS OVER-EXPANSION AT HIGH TORQUE

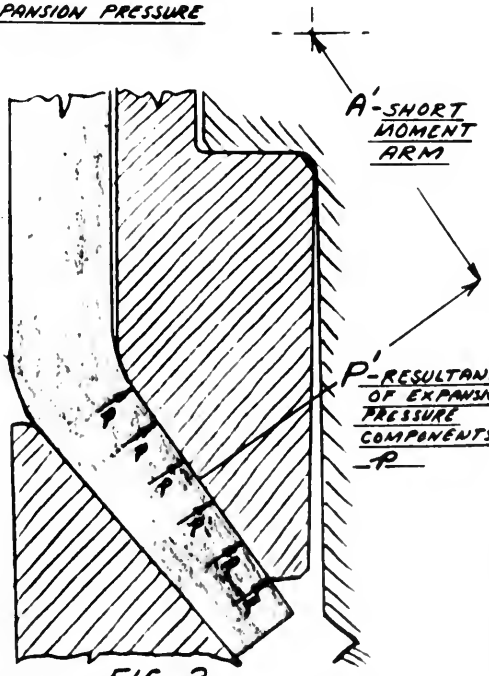

FIG. 2
INITIAL FULL CONTACT
REQUIRES HIGHER WRENCH TORQUE TO OBTAIN INITIAL EXPANSION

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

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Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 25-DD
JUN 15 1950

ADVANTAGES OF DIFFERENTIAL ANGLE

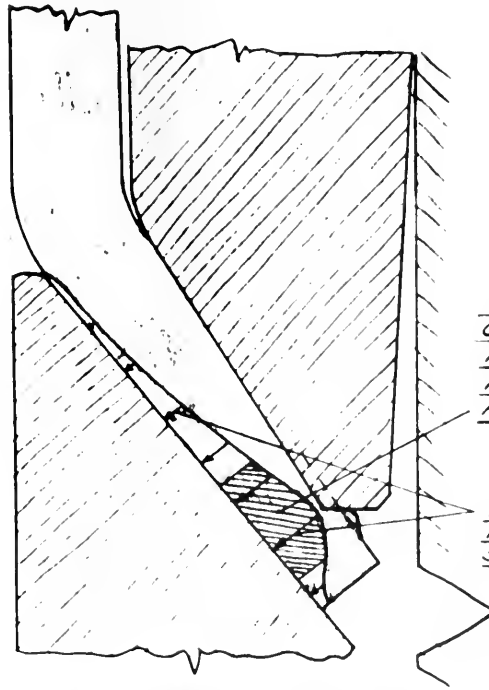
TOE CONTACT INCREASES WRENCH TORQUE RANGE

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C A. No. 7874-B
Parker v Collins - C. A. No 8023-B

Plaintiff's Exhibit No. 21-EE

JUN 15 1950

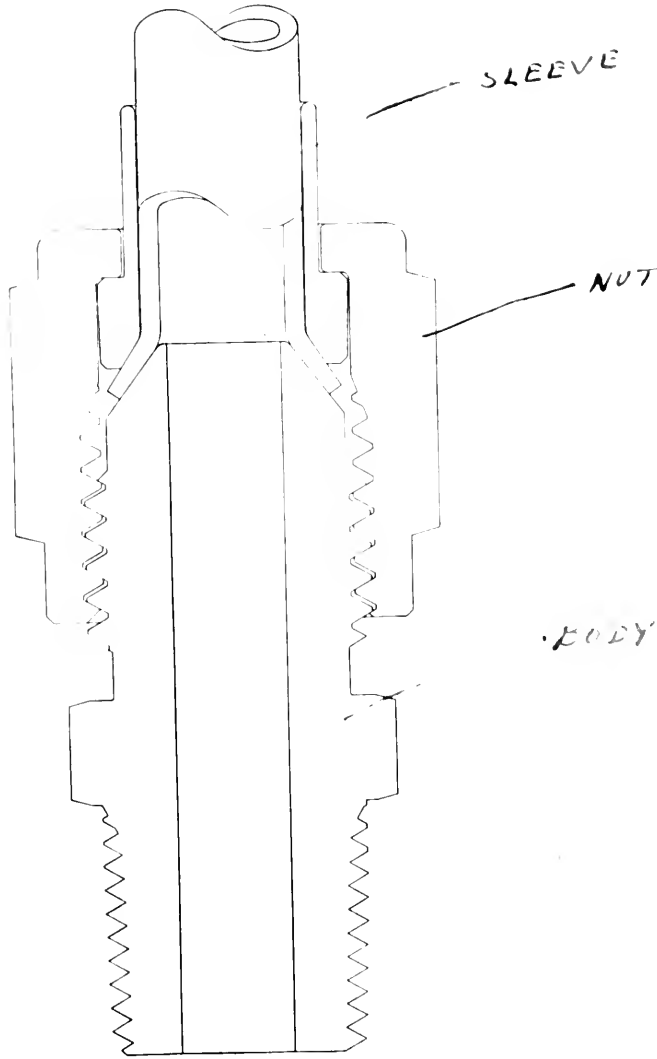


TOE CONTACT, BY PROVIDING AN APPROACH TO A LINE TYPE SEAL ESTABLISHES THE SEAL AT A LOWER WRENCH TORQUE WITH A CORRESPONDING INCREASE IN THE RANGE OF PERMISSABLE WRENCH TORQUES.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

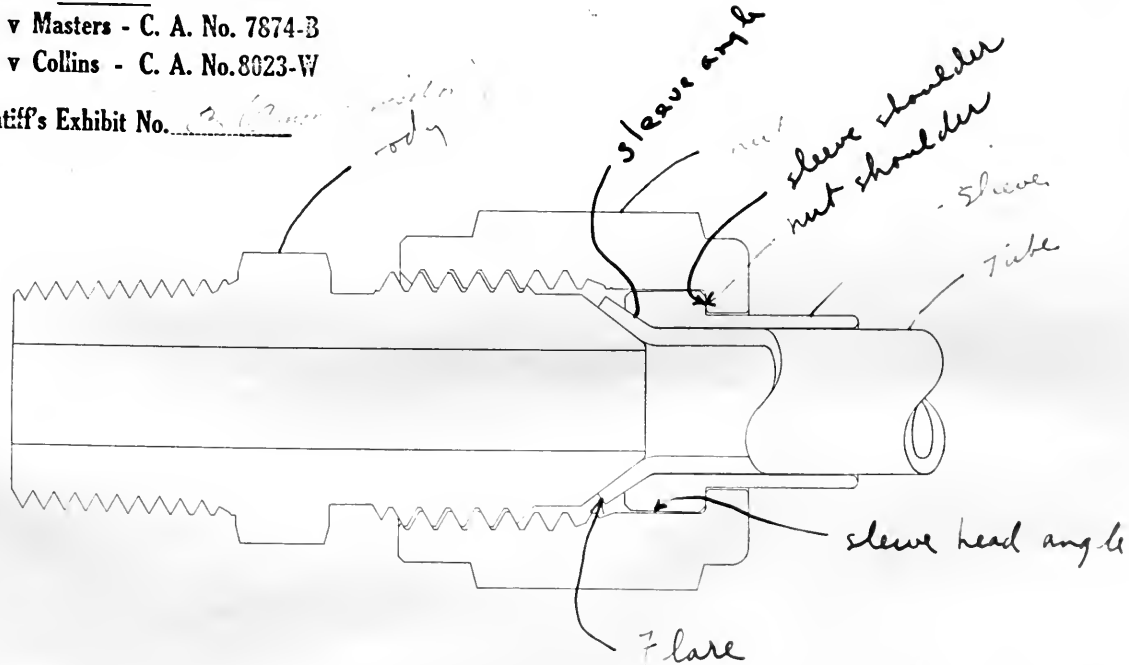
Parker v Masters - C. A. No. 78-4 B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 47
JUN 15 1950



In United States District Court
Southern District of California
Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-W

Plaintiff's Exhibit No. 3



IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B
Plaintiff's Exhibit No. 4-C
JUN 15 1950

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 49

JUN 16 1950

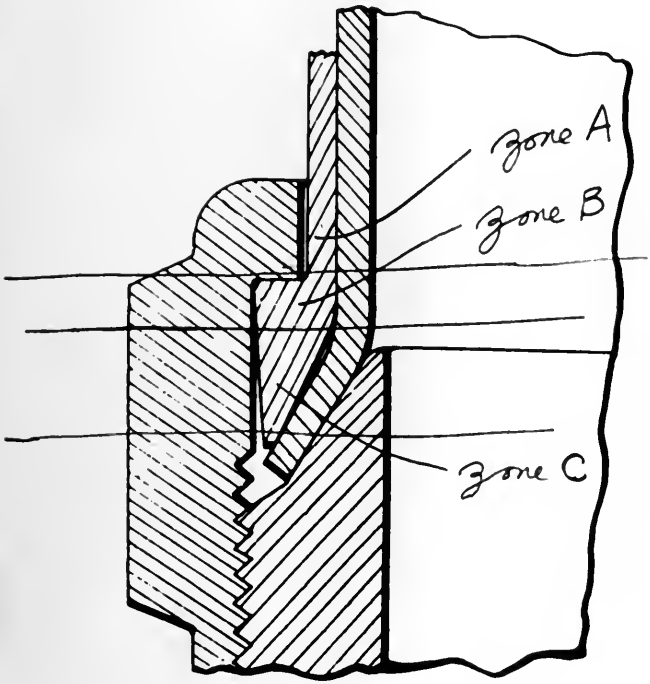


Fig. 1.

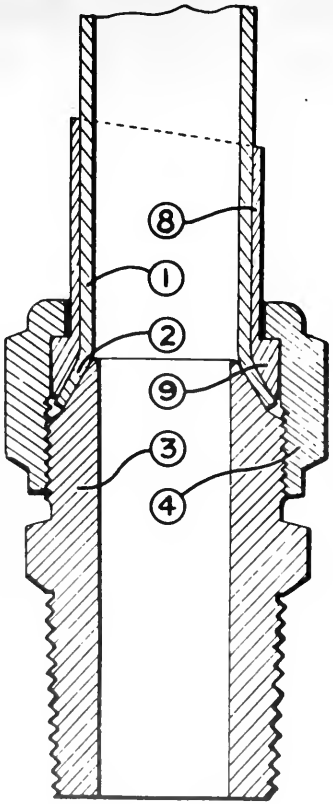


Fig. 2.

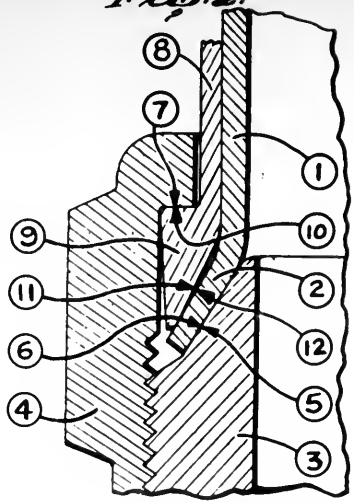
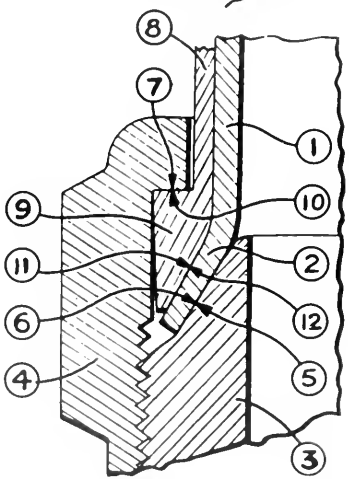


Fig. 3.



Aug. 20, 1940. A. L. PARKER 2,212,183

TUBE COUPLING

CLAIM 1. In a coupling for (1) tubes having the (2) ends thereof flared, (3)(4) coupling members having threaded engagement with each other, (3) one of said coupling members having a (5) seat associated therewith adapted to engage the (6) inner face of the (2) flared end of the (1) tube and the (4) other coupling member having a (7) clamping shoulder, a (8) sleeve surrounding said (1) tube and having a (9) solid head provided with a (10) shoulder against which the (7) clamping shoulder of the (4) coupling member engages, said (9) head having the (11) inner surface thereof provided with a coniform flare so shaped that the initial contact of the (9) head with the (2) flared end of the (1) tube is at the free end of the (9) head and adjacent the outer end of the (2) flared end of the (1) tube, whereby during the clamping action said (9) head will be expanded and moved forward along the (2) flared end of the (1) tube into intimate contact with the (12) outer surface thereof throughout substantially the entire extent of the (11) flared surface on the sleeve (8) head.

Fig. 1.

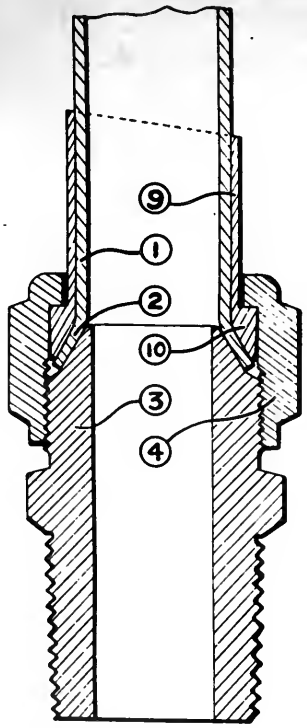


Fig. 2.

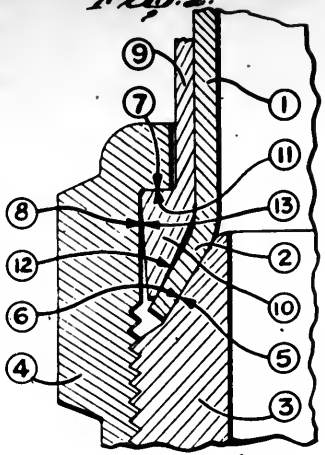
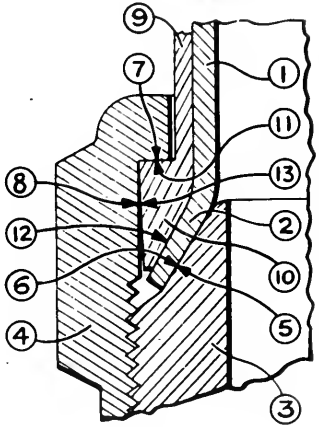


Fig. 3.



IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 51
JUN 16 1950

Aug. 20, 1940. A L PARKER 2,212,183

TUBE COUPLING

CLAIM 2. In a coupling for (1) tubes having the (2) ends thereof flared, (3)(4) coupling members having threaded engagement with each other, (3) one of said coupling members having a (5) seat associated therewith for engaging the (6) inner flare of the (2) flared end of the (1) tube and the (4) other coupling member having a (7) clamping shoulder and (8) an inner wall, (9) a sleeve surrounding said tube and having a (10) solid head capable of radial expansion during the clamping action, said (10) head being provided with a (11) clamping shoulder against which the (7) shoulder of the coupling member engages and an (12) inner flare surface for engaging the outer (2) flared end of the (1) tube, said (11) clamping shoulder being spaced a distance back of the (12) inner flare surface, the (13) outer surface of said (10) head and the said (8) inner wall of the (4) coupling member being so shaped relative to each other that when the sleeve (10) head expands during the clamping action they will contact only in the region of the (11) clamping shoulder, the remaining portion of the (10) head being free from contact with the (4) coupling member whereby the clamping force of the (10) head against the (1) tube is determined by the spring tension of the metal forming said (10) head.

Fig. 1

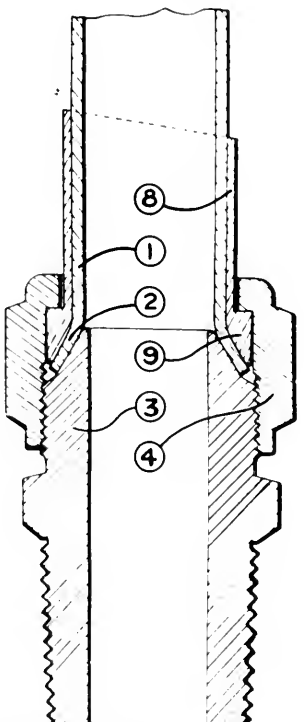


Fig. 2.

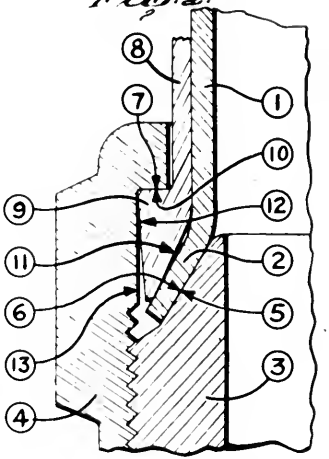
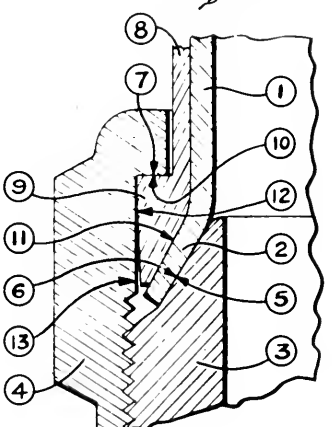


Fig. 3.



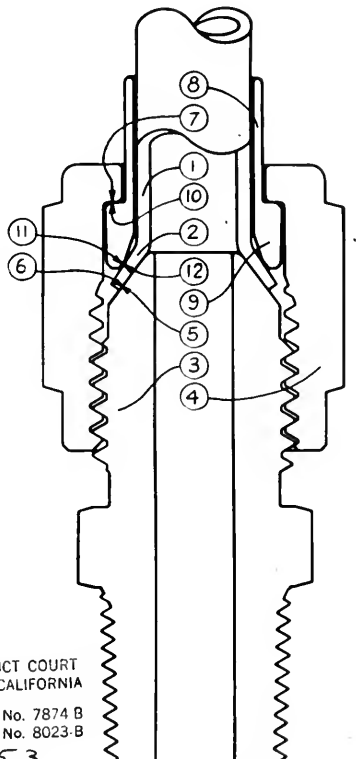
Aug. 20, 1940. A L PARKER 2,212,183

TUBE COUPLING

CLAIM 3. In a coupling for (1)tubes having the (2)ends thereof flared, (3)(4)coupling members having threaded engagement with each other, (3)one of said coupling members having a (5)seat associated therewith adapted to engage the (6)inner face of the (2)flared end of the (1)tube and the (4)other coupling member having a (7)clamping shoulder, (8)a sleeve surrounding said tube and having a (9)solid head provided with a (10)shoulder against which the (7)clamping shoulder of the (4)coupling member engages, said (9)head having the (11)inner surface thereof provided with a coniform flare so shaped that the initial contact of the (9)head with the (2)flared end of the (1)tube is at the free end of the (9)head and adjacent the outer end of the (2)flared end of the tube, (12)the outer surface of said (9)head and said (13)inner wall of the (4)coupling member being so shaped relative to each other that when the sleeve (9)head expands during the clamping action, the portion of said (9)head contacting with the (2)flared end of the (1)tube is at all times out of contact with the (4)coupling member whereby the clamping face of the (9)head against the (2)tube end is determined by the spring tension of the metal forming said (9)head.

1384

MASTERS FITTING
with double angle sleeve



IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 53

JUN 16 1950

Aug. 20, 1940. A. L. PARKER TUBE COUPLING 2,212,183

CLAIM 1. In a coupling for (1) tubes having the (2) ends thereof flared, (3)(4) coupling members having threaded engagement with each other, (3) one of said coupling members having a (5) seat associated therewith adapted to engage the (6) inner face of the (2) flared end of the (1) tube and the (4) other coupling member having a (7) clamping shoulder, a (8) sleeve surrounding said (1) tube and having a (9) solid head provided with a (10) shoulder against which the (7) clamping shoulder of the (4) coupling member engages, said (9) head having the (11) inner surface thereof provided with a coniform flare so shaped that the initial contact of the (9) head with the (2) flared end of the (1) tube is at the free end of the (9) head and adjacent the outer end of the (2) flared end of the (1) tube, whereby during the clamping action said (9) head will be expanded and moved forward along the (2) flared end of the (1) tube into intimate contact with the (12) outer surface thereof throughout substantially the entire extent of the (11) flared surface on the sleeve (9) head.

1385

Mailing Address:
POST OFFICE BOX 150
GLENDALE, CALIFORNIA

SHIPPING NOTICE

IRVIN W. MASTERS, INC.

3035 ANDRITA STREET
LOS ANGELES 41, CALIFORNIA
CLeveland 6-2264

Shipper Number 9911

Customer Order Verbal

Charge To PAUL GEIL

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 5-4
JUN 1 3 1950

Date Shipped _____

Number Packages _____

Shipped To Same

Total Weight _____

F.O.B. Factory Ship Via Called for Terms

Unshipped Balance	DESCRIPTION	Quantity Shipped		
Item 1				
0	AN818-4	20	.25	$ 5.00
Item 2				
0	AN819-4Z	20	.06	1.20
Item 3				
0	AN822-4	20	.54	10.80
				$ 17.00
	Sales Tax			.43
				$ 17.43

This shipment completes the order.

9.30=47

Manufacturers of Fittings for Aeronautical Plumbing

CLAIMS—For shortage, or defective material must be made within 15 days from date received

Form 158

Mailing Address:
POST OFFICE BOX 150
GLENDALE, CALIFORNIA

SHIPPING NOTICE

IRVIN W. MASTERS, INC.
3035 ANDRITA STREET
LOS ANGELES 41, CALIFORNIA
Cleveland 6 2264

Shipper Number 9910

Customer Order Verbal

Charge To PAUL GEIL

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
Parker v Masters - C A. No. 7874-B
Parker v Collins - C. A. No. 8023-B
Plaintiff's Exhibit No. 50
JUN 16 1950

Date Shipped SEP [illegible]

Number Packages

Total Weight

Shipped To Same

F.O.B. Factory Ship Via Called for Terms

Unshipped Balance	DESCRIPTION	Quantity Shipped		
Item 1 (34)				
0	AN818-4D	32	.04	$ 1.28
Item 2 (Y6)				
0	AN819-4Z	32	.06	1.92
Item 3 (4)				
0	AN822-4D	32	.24	7.68
				$ 10.88
			Sales Tax	.27
				$ 11.15

This shipment completes the order.

Manufacturers of Fittings for Aeronautical Plumbing

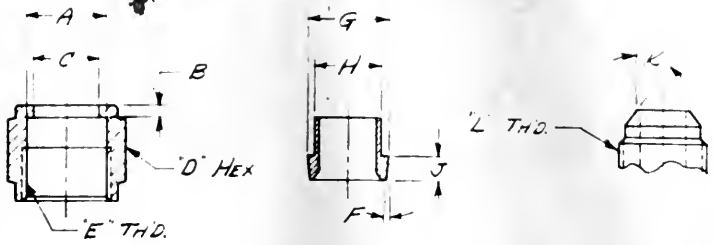
CLAIMS—For shortage, or defective material must be made within 15 days from date received

Form 158

THE PARKER APPLIANCE CO — CLEVELAND, OHIO

MASTERS' DEPOSITION FITTING

MEASUREMENTS OF PARTS



SAMPLE / SIZE	MAT'L	DEPOS. EXH NO.	AN 818 NUT A	B	C	D	E
A-4	ALUM ALLOY						
B-4	"		.391	.085	.308	9/16	7/16-20
C-4	"		.3905	.086	.308	9/16	7/16-20
A-8	ALUM. ALLOY						
B-8	"		.6865	.115	.5715	7/8	3/4-16
C-8	BRASS		.689	.126	.5715	7/8	3/4-16

SAMPLE / SIZE	MAT'L	DEPOS. EXH. NO.	AN 819 SLEEVE F	G	H	J
A-4	COP. SIL			.3825		
B-4	"		5°42'	.382	.297	.140
C-4	"		1°	.382	.2975	.139
A-8	COP. SIL.			.682		
B-8	"		8°15'	.682	.560	.221
C-8	"		8°14'	.682	.5595	.221

SAMP NO.	DEPOS EXH NO.	BODY DESC & MAT'L	K	L
A		AN816-4 AL ALLOY		
B		"	36°25'	7/8-20
C		"	36°22'	7/8-20
A				
B		AN816-8 AL ALLOY	37°30'	3/4-16
C			36°47'	3/4-16

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 57

JUN 1 6 1950

57

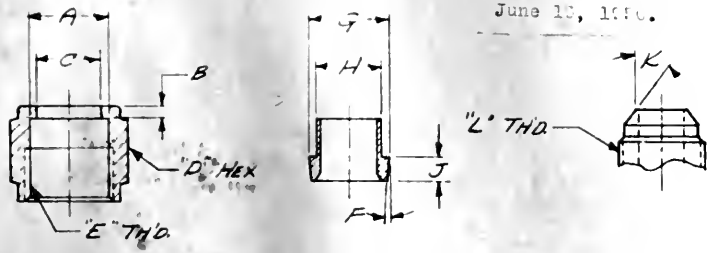
THE PARKER APPLIANCE CO — CLEVELAND, OHIO

COLLINS' DEPOSITION FITTINGS

MEASUREMENT OF PARTS

Plaintiff's Ex [illegible] No. [illegible]

June 13, 1916.



SAMPLE & SIZE	AN 818 NUT						
	MAT'L	DEPOS. EXH. NO.	A	B	C	D	E
A-4							
B-4	STEEL		.388	.075	.307	9/16	7/16-20
C-4							
A-8							
B-8	STEEL		.689	.112	.571	7/8	3/4-16
C-8	"		.690	.108	.5725	7/8	3/4-16
A-4							
B-4							
C-4	STEEL		.388	.079	.306	9/16	7/16-20

SAMPLE & SIZE	AN 819 SLEEVE					
	MAT'L	DEPOS. EXH NO	F	G	H	J
A-4				.3815		
B-4	STEEL		1°	.381	.295	.142
C-4						
A-8				.680		
B-8	COPPER SILICON		0°30'	.681	.5615	.213
C-8	"		0°39'	.680	.562	.216
A-4						
B-4						
C-4	STEEL		1°8'	.381	.296	.149

SAMPLE NO	BODY			
	DEPOS. EXH NO	DESC. & MAT:	K	L
A				
B		AN 823-A STEEL	36°55'	7/16-20
C		"	37°25'	7/16-20
A				
B		ANA 6-A STEEL	37°15'	3/4-16
C		ANA 6-B STEEL	37°20'	3/4-16
A		ANA 67-A Hi. ALLOY	36°52'	7/16-20
B		"	37°2'	7/16-20
C		"	37°5'	7/16-20

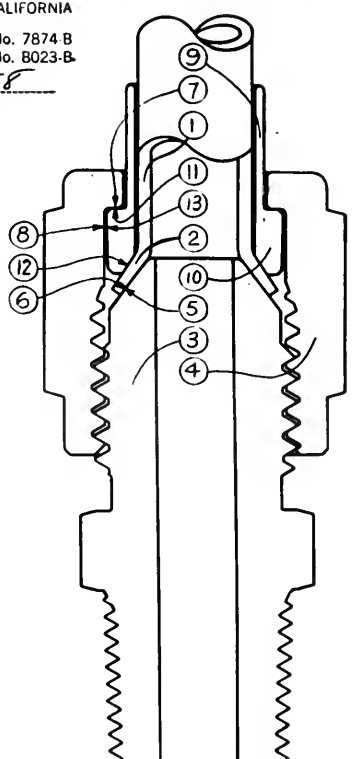
MASTERS FITTING
with single angle sleeve

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. B023-B

Plaintiff's Exhibit No. 58

JUN 1 6 1950



Aug. 20, 1940. A. L. PARKER 2,212,183

TUBE COUPLING

CLAIM 2. In a coupling for (1) tubes having the (2) ends thereof flared, (3)(4) coupling members having threaded engagement with each other, (3) one of said coupling members having a (5) seat associated therewith for engaging the (6) inner flare of the (2) flared end of the (1) tube and the (4) other coupling member having a (7) clamping shoulder and (8) an inner wall, (9) a sleeve surrounding said tube and having a (10) solid head capable of radial expansion during the clamping action, said (10) head being provided with a (11) clamping shoulder against which the (7) shoulder of the coupling member engages and an (12) inner flare surface for engaging the outer (2) flared end of the (1) tube, said (11) clamping shoulder being spaced a distance back of the (12) inner flare surface, the (13) outer surface of said (10) head and the said (8) inner wall of the (4) coupling member being so shaped relative to each other that when the sleeve (10) head expands during the clamping action they will contact only in the region of the (11) clamping shoulder, the remaining portion of the (10) head being free from contact with the (4) coupling member whereby the clamping force of the (10) head against the (1) tube is determined by the spring tension of the metal forming said (10) head.

1,390

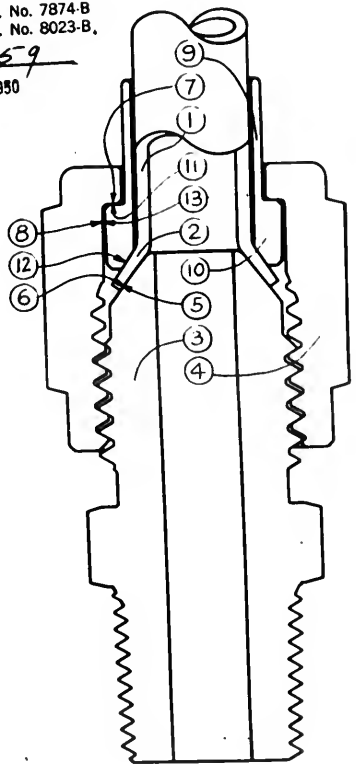
COLLINS FITTING
with single angle sleeve

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA,

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B,

Plaintiff's Exhibit No. 59

JUN 16 1950



Aug. 20, 1940. A. L. PARKER 2,212,183

TUBE COUPLING

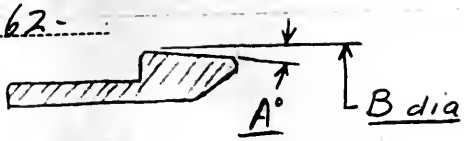
CLAIM 2. In a coupling for (1) tubes having the (2) ends thereof flared, (3)(4) coupling members having threaded engagement with each other, (3) one of said coupling members having a (5) seat associated therewith for engaging the (6) inner flare of the (2) flared end of the (1) tube and the (4) other coupling member having a (7) clamping shoulder and (8) an inner wall, (9) a sleeve surrounding said tube and having a (10) solid head capable of radial expansion during the clamping action, said (10) head being provided with a (11) clamping shoulder against which the (7) shoulder of the coupling member engages and an (12) inner flare surface for engaging the outer (2) flared end of the (1) tube, said (11) clamping shoulder being spaced a distance back of the (12) inner flare surface, the (13) outer surface of said (10) head and the said (8) inner wall of the (4) coupling member being so shaped relative to each other that when the sleeve (10) head expands during the clamping action they will contact only in the region of the (11) clamping shoulder, the remaining portion of the (10) head being free from contact with the (4) coupling member whereby the clamping force of the (10) head against the (1) tube is determined by the spring tension of the metal forming said (10) head.

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 62
JUN 21 1950

1.706
1.721



SIZE 24 A = B = 1.781 1.784

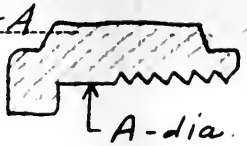
COPPER SILICON (CAD PLATED)			
SAMPLE NO.	A	B	
1	1°21 min	1.781	1.718
2	1°10 min	1.786	1.719
3	1°35 min	1.784	1.712
4	1°29 min	1.7835	
5	1°7 min	1.7843	
6	1°35 min	1.7835	
7	1°27 min	1.7845	
8	1°8 min	1.7865	
9			
10			
11			
12			
13			
14			
15			

STEEL (BLACK)			
SAMPLE NO.	A	B	
1	1°41 min	1.7845	1.708
2	1°9 min	1.7818	1.718
3	1°40 min	1.7835	1.720
4	1°42 min	1.7845	
5	1°43 min	1.785	
6	1°10 min	1.7835	
7	1°38 min	1.7825	
8	1°40 min	1.784	
9			
10			
11			
12			
13			
14			
15			

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Plaintiff's Exhibit No. 62-A
JUN 2 1 1950



$1\frac{7}{8}$ - 12

SIZE 24 A = 1.791 / 1.794

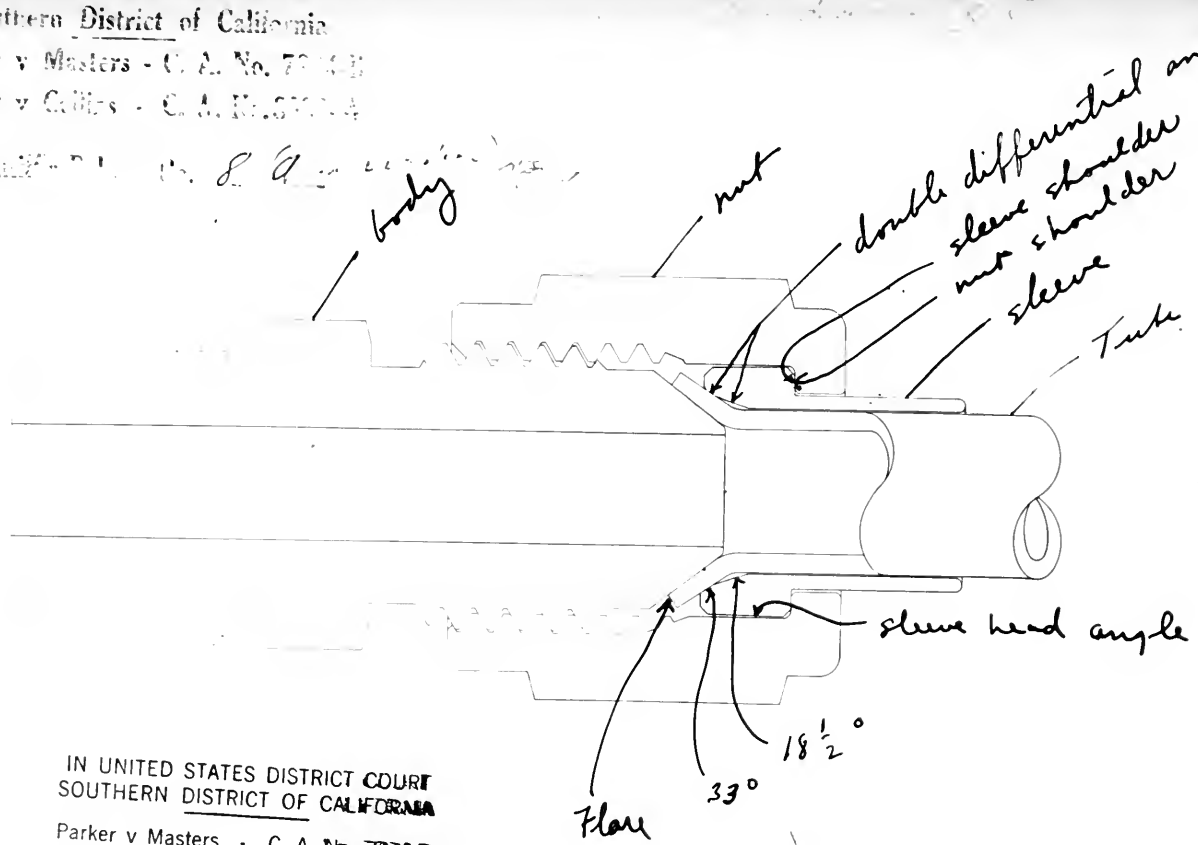
Aw = 750

ALUM. ALLOY	
SAMPLE NO.	A
1	1.7915
2	1.7915
3	1.7915
4	1.791
5	1.791
6	1.791
7	1.791
8	1.791
9	
10	
11	
12	
13	
14	
15	

STEEL	
SAMPLE NO.	A
1	1.791
2	1.7915
3	1.7915
4	1.7915
5	1.7915
6	1.7915
7	1.7915
8	1.7915
9	
10	
11	
12	
13	
14	
15	

SK-

In United States District Court
Southern District of California
Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B
Plaintiff's Exhibit No. 8 & 9



IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B
Plaintiff's Exhibit No. 20
JUN 21 1960

1393

PLAINTIFF'S EXHIBIT No. 72

Aircraft Report
No. P-151-L

Parker Type Fittings
Requirements vs. Capacities

Prepared as a basis for determining adequacy of Production Facilities by Industrial Resources Branch and Requirements Branch Production Resources Section, Material Center, Wright Field for the Aircraft Scheduling Unit, W. P. B.

This document contains information affecting the National Defense of the United States within the meaning of the Espionage Act, 50 U. S. C. 31 & 32. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

Copy No. 10 Issued to .....

Confidential

Industrial Resources Branch and Requirements Branch
Production Resources Section
Nicol High Building
Dayton, Ohio

CONFIDENTIAL

PARKER TYPE FITTINGS
REQUIREMENTS VS. CAPACITIES
Projected on 8-L Program
Advanced 90 Days Ahead of Airframe Schedule

Spares: 67% Spare Fittings

Units: 2000 Fittings

P-153-L

MANUFACTURER	LOCATION	TYPES OF FITTINGS	PERCENT SPARES	1943 FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	1944 JAN.	FEB.	MAR.	OPEN CAPACITY JULY 43 - JAN. 44 (In excess of present orders)	
CAPACITIES (All Commercial)																			
Aircraft Fittings	Cleveland, Ohio	Brass, bronze, aluminum & steel	10	1250	1500	1550	1600	1650	1500	1581	1667	1750	1833	1917	2000	2000	2000		
Allied Appliance	Los Angeles, Calif.	AN, AC, NAF	20	92	133	175	217	258	300	300	300	300	300	300	300	300	300	Indefinite	
Amerikom Servo Products	Los Angeles, Calif.	Nuts, elbows, nipples, caps, tees, connectors, crosses, plugs, sleeves, unions, couplings, adapters	20	2855	5282	3712	4141	4571	5000	5000	5000	5000	5000	5000	5000	5000	5000	None	None
California Metal Enameling	Los Angeles, Calif.	Durel chiefly, AC411 only	70	71	87	103	118	134	150	150	150	150	150	150	150	150	150		
Comet Manufacturing Co.	Brooklyn, N.Y.	Durel & copper alloy AC and AF	0	758	816	883	955	1028	1100	1100	1100	1100	1100	1100	1100	1100	1100	Indefinite	
Commonwealth Brass Co.	Detroit, Mich.	Brass only. Large Prod. of plugs		1533	1567	1600	1633	1667	1700	1717	1733	1750	1767	1783	1800	1800	1800	None	None
Curtiss Manning Works	Los Angeles, Calif.	7/8, 8 & 10; AN6, 8 & 10	98	10	10	10	10	10	10	10	10	10	10	10	10	10	10	None	None
Cuttle Manufacturing Co.	Los Angeles, Calif.	Durel brass	55	397	515	650	747	843	980	1042	1143	1225	1307	1388	1470	1470	1470	Large	1000
Detroit Brass & Malleable	Detroit, Mich.	Brass only	65	138	140	143	145	148	150	150	150	150	150	150	150	150	150	None	None
Delta Aircraft Mfg. Co.	Dallas, Texas	AN615 AN616	0	25	30	35	40	45	50	50	50	50	50	50	50	50	50	50	50
Dole Valve Company	Chicago, Ill.			5167	3333	3500	3667	3833	4000	4167	4333	4500	4667	4833	5000	5000	5000		
Drafte Corporation	Cleebranton, Pa.	AN811 & AN186 Steel only	80	81	84	87	88	89	90	92	93	95	97	98	100	100	100	45	40
Dunbar Eagle Inc.	Chicago, Ill.	Reif 14 811-8; extensive line	50	575	700	1025	1350	1675	2000	2000	2000	2000	2000	2000	2000	2000	2000	1000	750
Eaton Carburetor Co. Ltd.	Huntington Park, Cal.	Brass & aluminum	10	91	108	125	142	159	176	172	168	164	160	156	152	152	152	158	145
Oilfillas Bros., Inc.	Los Angeles, Cal.			200	200	200	200	200	200	200	200	200	200	200	200	200	200	None	None
O.H.M. Brant	Los Angeles, Cal.	AN810, 812, 814, 914 Bronze & alum.	90	63	82	102	121	141	160	160	160	160	160	160	160	160	160	None	None
Brimmell Company	Providence, R.I.	Brass, Durel, no steel	50	417	633	850	1067	1283	1500	1583	1667	1750	1833	1917	2000	2000	2000		
B-W Thermo Control Co.	Los Angeles, Cal.	Clevers		258	407	555	703	852	1000	1000	1000	1000	1000	1000	1000	1000	1000	700	500
Bartsell Aviation	Los Angeles, Cal.	AN-810, 812, 814	75	86	89	92	94	97	100	101	102	103	103	104	105	105	105	45	105
Industrial Formings Co.	Burbank, Cal.	Aluminum only	75	65	115	165	215	265	315	323	332	340	348	357	365	365	365	None	None
Kohler Company	Kohler, Wisc.			See source															
Lunkenheimer Company	Cincinnati, Ohio		75	271	292	313	333	354	375	375	375	375	375	375	375	375	375	None	None
Masters, I. W.	Glendale, Calif.		33	708	817	925	1033	1142	1250	1292	1333	1375	1417	1458	1500	1500	1500	750	1350
National Brass Mfg. Co.	Rochester, N. Y.	Brass and bronze only	72	125	133	142	151	161	170	175	180	185	190	195	200	200	200	None	None
Northern Indiana Brass Co.	Elkhart, Ind.	AN-835, 836, 850, 841, 852, 855	100															None	None
Norton Laster Company	Chicago, Ill.	AC811, Brass & Aluminum	0	563	590	618	645	673	700	717	733	750	767	783	800	800	800	None	None
Ohio Pattern & Foundry Co.	Cincinnati, Ohio	18 fittings, 128 sizes, brass	100	108	107	105	103	102	100	100	100	100	100	100	100	100	100	None	None
Pacific Piston Ring Co.	Los Angeles, Calif.	Durel only	100	77	78	80	82	83	85	88	90	93	95	98	100	100	100	None	None
Parker Appliance Co.	Cleveland, Ohio	Complete line, 90% aircraft	20	9500	10000	10500	11000	11500	12000	12500	13000	13500	14000	14500	15000	15000	15000		
Perlies, R., Brass Co.	Milwaukee, Wis.	Copper alloys	69	23	29	34	39	45	50	50	50	50	50	50	50	50	50	10	50
Price Pfister Brass Mfg.Co.	Los Angeles, Cal.	Extensive line of shapes, brass, alum.	100	71	77	83	88	94	100	106	117	125	133	142	150	150	150		
Public Service Brass Co.	Huntington Park, Cal.	Tees, elbow, crosses	75	96	97	98	98	99	100	100	100	100	100	100	100	100	100	None	None
Saybould Coupling Co.	Weedsville, Pa.	95% AN hose & pipe fittings, alum. only	65	93	100	108	115	123	130	130	130	130	130	130	130	130	130	None	None
Seres Seshine Products Co. Inc.	Providence, R. I.	Brass, alum. and steel	80	Small															
Springfield Brass Co.	Springfield, Ohio	Brass elbows and flanges	100	10	10	10	10	10	10	10	10	10	10	10	10	10	10	None	None
Standard Pumate Control Co.	Burbank, Cal.	Brass and Durel		57	61	65	69	73	77	73	70	73	77	80	80	80	80	None	None
Swift Lubricator Co.	Elmyra, N. Y.	Nuts, unions, nipples, couplings, bulkhead unions, pipe fittings, durel, steel, brass	0	167	185	200	217	233	250	250	250	250	250	250	250	250	250	100	100
Trenton Brass & Machine Co.	Trenton, N.Y.	Brass only	80	158	160	163	165	168	170	175	180	185	190	195	200	200	200	100	100
Union Brass-Metal Mfg. Co.	St. Paul, Minn.	Copper alloys	100	160	160	160	160	160	160	167	173	180	187	193	200	200	200		
Weatherhead Co., The	Cleveland, Ohio	AC811, no brass, AN814-55, AN840-48, inc. & AN910-24 inc.	53	6667	6833	7000	7167	7333	7500	7500	7500	7500	7500	7500	7500	7500	7500	None	None
Wells Aircraft Parts Co.	Los Angeles, Cal.	Steel only	18	91	110	129	148	166	185	254	323	393	462	531	600	600	600	None	None
TOTAL				30836	35811	36056	38658	41269	43876	44974	46069	47168	48264	49360	50457	50457	50457		

Notes:
a. Requirements were obtained from Requirements Branch, Production Resources Section, project R-186 dated September 2, 1942.
b. Capacities were obtained from manufacturers and represent their ability to make Parker Type Fittings.
c. A 67% spare factor is authorized by Air Service Command, Patterson Field, and Bureau of Aeronautics.
d. A study of the list of fittings used in the determination of requirements indicates that the fittings listed represent probably 80 out of each 100 produced, the difference being an allowance for non-current items, omissions and non-aircraft items.
e. Parker Type Fittings -- includes AN, AC, NAF, and special aircraft fittings.
f. "Shapes" - made from castings or forgings as distinguished from "straights" made from bar stock.

Clearance cancelled

By [signature] Signature and Grade

Date 8 June 1943

APPROVED by the Aircraft Scheduling Unit at its regular meeting on Feb 27 1943

E. M. STURHAHN
Recorder

In using this report, first consideration should be given to the possibility of achieving the program on which this report is based. This report is not to be used as a basis for allocations, but merely as a basis for determining the adequacy of production facilities.

Checked 4/1943
W.S. Armstrong

Industrial Resources Branch and Requirements Branch
Production Resources Section
Steele High Building
Dayton, Ohio

CONFIDENTIAL

P-151-A

PARKER TYPE FITTINGS
REQUIREMENTS VS. CAPACITIES
Projected on 8-L Program
Advanced 90 Days Ahead of Airframe Schedule

Spares: 67% Spare Fittings

Units: Each

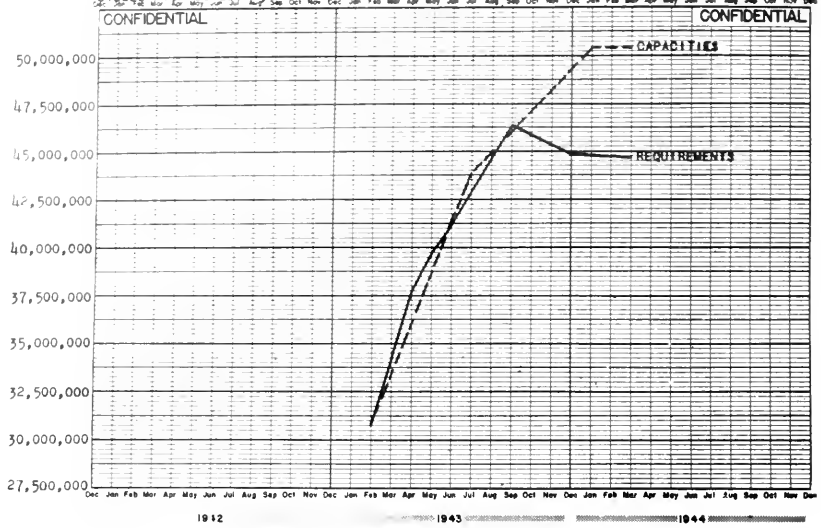
ITEM	1943 FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	1944 JAN.	FEB.	MAR.
REQUIREMENTS														
Aircraft Installations	14732659	16598678	18042870	19015854	19729557	20547118	21344739	22182551	21953850	21725362	21496888	21267608	21038328	21809048
Aircraft Spares 67%	9870878	10987114	12086981	12746622	13218803	13766589	14514375	14862162	14709080	14555995	14402915	14382297	14363680	14344062
Total Aircraft	24603551	27585792	30127751	31756476	32948360	34313737	35679114	37044493	36662930	36281359	35899803	35850905	35802008	35753110
Non-Aircraft 25% (See note A)	6150883	6896448	7531813	7939119	8237090	8578434	8919779	9261125	9165735	9070339	8974951	8962726	8950502	8938278
Total Aircraft & Non-Aircraft Requirements	30754434	34482240	37659564	39695595	41185450	42892171	44598895	46305616	45828665	45351698	44874754	44813631	44752510	44691388
CAPACITIES														
Total Aircraft & Non-Aircraft Capacities	30836000	33441000	36056000	38658000	41269000	43876000	44976000	46069000	47168000	48264000	49360000	50457000	50457000	50457000
Surplus	81586	-791240	-1603564	-1037595	83550	983829	575107	-236616	1339337	2912306	4485246	5643369	5704490	5765612
Cumulative Surplus	81586	-709654	-2313218	-3350813	-3267263	-2283434	-1907827	-2144443	-805106	2107200	6592446	12235815	17940305	23705917
Surplus as Per Cent of Capacities	.3%	-2.4%	-4.4%	-2.7%	.2%	2.2%	.8%	- .5%	2.8%	6.0%	9.1%	11.2%	11.3%	11.4%

Notes: a. Requirements were obtained from Requirements Branch, Production Resources Section, project R-186 dated September 2, 1942.
b. Capacities were obtained directly from manufacturers and represent their ability to make Parker Type Fittings.
c. A 67% spare factor is authorized by Air Service Command, Patterson Field, and Bureau of Aeronautics.
d. A study of the list of fittings used in the determination of requirements indicates that the fittings listed represent probably 80 out of each 100 produced, the difference being an allowance for non-current items, emissions and non-aircraft items.
e. Parker Type Fittings -- Includes AN, AC, NAF, and special aircraft fittings.

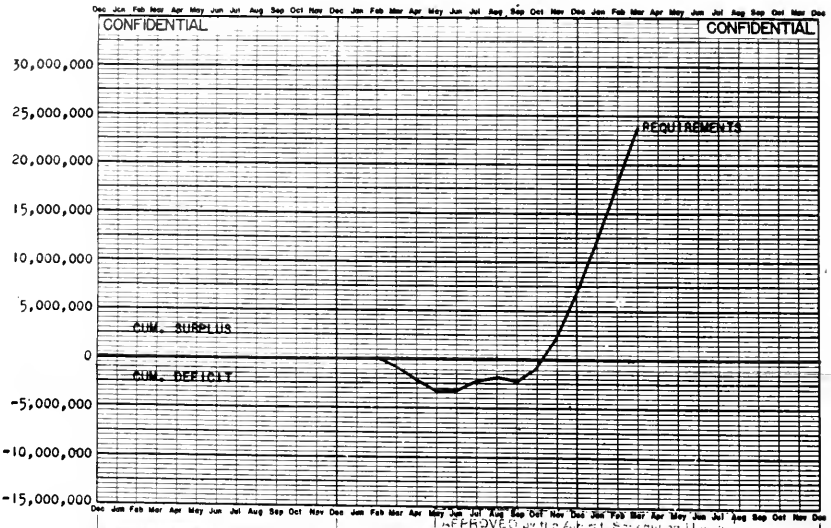
In using this report, first consideration should be given to the possibility of achieving the program on which this report is based. This report is not to be used as a basis for allocations, but merely as a basis for determining the adequacy of production facilities.

IND. RESOURCES BRANCH AND REQ. BRANCH
PRODUCTION RESOURCES SECTION
STEELE HIGH BUILDING, DAYTON, OHIO

REPORT P-651-L CHART NO. 1
PARKER TYPE FITTINGS
FEBRUARY 25, 1943



UNITS: EACH



Classification cancelled

By authority of

By

Date

APPROVED by the Project Section at its regular meeting on Feb 24 1943

F. M. STEPHAN
Recorder

1460

PLAINTIFF'S EXHIBIT No. 73

The Parker Appliance Company
Cleveland 12, Ohio

(Copy)

March 3rd, 1941
Flared Tube Fittings

Assistant Chief
Material Division
Wright Field
Dayton, Ohio

Major K. B. Wolfe
Chief Production Engineering Section

Gentlemen:

Enclosed are typical data sheets giving complete detailed manufacturing specifications for flared tube fittings as listed on Air Corps Standards Book Sheet 811. This letter will constitute authority to release this information on government drawings as a part of the Air Corps Standards Book or of an Army-Navy Specification, including any standard notes which are a part thereof.

The Sheets attached do not include all standard tube couplings listed on Air Corps Sheet 811, however, within a few days sheets covering this whole series can be made available. Along with Air Corps drawings and specifications now available for hose assemblies, hydraulic fittings, and other units, the release of this data will make available complete information covering items of tube fittings and associated parts now used in aircraft fuel, oil, hydraulic and instrument circuits.

Manufacturing tolerances noted on these sample sheets have been liberalized wherever our experience has indicated that such a change is permissible without adversely affecting the performance of the unit, and where such a change may facilitate the use of a broader group of manufacturing facilities to assure adequate production to meet the demands of the stepped-up defense aircraft production schedules. We wish to assure the Material Division of our full cooperation to this end.

THE PARKER APPLIANCE COMPANY,

A. L. PARKER.

FEAmon/dn

Enclosure: Drawings AN 811-CT; -BT; -T; -FT; -ST; -ET; -JT

Parker copy.

Received in evidence June 21, 1950.

73-A

WAR DEPARTMENT
AIR CORPS
MATERIEL DIVISION

Wright Field, Dayton, Ohio
May 25, 1942

Subject: Flared Tube Fittings.

RECEIVED
MAY 27 1942
PRINT No.

To: Parker Appliance Company,
17325 Euclid Avenue,
Cleveland, Ohio.

Ref. letter re AN Fittings files in Hamer's Section

1. Reference is made to your letter of March 3, 1941, addressed to Assistant Chief, Materiel Division, Wright Field, on the subject of Flared Tube Fittings. It is believed to have been your intention by that letter to assist the war effort by granting a license to the United States Government, for the duration of the present emergency, to make and use, and to have made or reproduced, by manufacturers other than your company, flared tube fittings as listed on Air Corps Standard Book, Sheet 511, in accordance with drawings and detailed manufacturing specifications supplied with your said letter of March 3, 1941, without liability on the part of the Government or on the part of any such other manufacturers, in connection with any patents owned or controlled by you.

2. It is also believed to have been your intention by that letter to permit the Government, for the duration of the present emergency, to submit your designs of said fittings incorporated in the drawings and detailed manufacturing specifications supplied by you, to manufacturers other than your company, for the purpose of enabling such other manufacturers to make and supply to the Government the flared tube fittings above identified without liability on the part of the Government or on the part of any other such manufacturers in connection with such use of your said drawings and detailed manufacturing specifications.

3. An early reply from you confirming the foregoing understanding will be appreciated.

A. E. JONES,
Colonel, Air Corps,
Chief, Contract Section.

Mar. 3, 1941 letter enclosed drawings for AC511 fittings & stated that it "will constitute authority to release this information on said drawings as a part of the Air Corps Standards Book or any Army-Navy specifications, including any standard notes which are a part thereof."

PLAINTIFF'S EXHIBIT No. 73B

#210 file

June 18th, 1942

Commanding General
Army Air Forces
Material Center
Wright Field
Dayton, Ohio

Colonel A. E. Jones,
Chief, Contract Section

Dear Sir:

We have your letter of May 25, 1942, wherein you place certain interpretations on our letter of March 3, 1941, addressed to Assistant Chief, Material Division, Wright Field on the subject of Flared Tube Fittings.

We do not believe that such an interpretation should be specifically placed on our letter of March 3, 1941. To avoid any further ambiguity in this matter, however, this letter shall constitute your authority to take the following actions to assist the war effort:

1. For the duration of the present National Emergency, the United States Government can make and use, or can have made for its use by manufacturers other than The Parker Appliance Company, flared tube fittings as listed on Air Corps Standard Book, Sheet 811, in accordance with drawings and detailed manufacturing specifications supplied with our letter of March 3, 1941, without liability on the part of the

United States Government or on the part of any such other manufacturer, in connection with any patents owned or controlled by The Parker Appliance Company;

2. For the duration of the present National Emergency, the United States Government can submit the designs of said flared tube fittings incorporated in the drawings and manufacturing specifications heretofore supplied by The Parker Appliance Company, to manufacturers other than The Parker Appliance Company, for the purpose of enabling such other manufacturers to make for and supply directly to the United States Government said flared tube fittings, without liability on the part of the United States Government or on the part of any other such manufacturer in connection with such use of said drawings and detailed manufacturing specifications.

In addition, please be advised that sometime ago we adopted the policy, in view of the requests from Government agencies for additional sources of manufacture for our products, and in the interest of National Defense, to grant licenses to manufacturers permitting them to manufacture various items of our products for the duration of the present emergency, royalty free. This policy was stated in detail in our letter of September 10, 1941, to the Assistant Chief, Material Division, Wright Field, attention Lt. Col. K. B. Wolfe, Chief, Production Engineering Section.

In this connection, we have worked out a standard

form of license which we propose to grant to such persons. This personal, non-exclusive license agreement permits the licensee, for the duration of the National Emergency, to manufacture, only in his own plant, and sell Parker fittings and valves for use in aircraft, without payment of royalty.

We trust that this clearly answers your letter of May 25, 1941.

Very truly yours,

THE PARKER APPLIANCE COMPANY,

C. H. WAGNER, JR.,
Assistant Secretary.

(Parker copy)

Received in evidence June 21, 1950.

PLAINTIFF'S EXHIBIT No. 77

In the District Court of the United States for the Eastern District of Michigan, Southern Division
Civil Action No. 8274

THE PARKER APPLIANCE COMPANY,
Plaintiff,

vs.

V. L. GRAF COMPANY, INC.,
Defendant.

FINAL JUDGMENT

The above-entitled action having been instituted by Plaintiff by the filing of a Complaint, praying

for injunction restraining Defendant from infringement of Plaintiff's Letters Patent, and the summons and Complaint having been served upon Defendant, and Defendant having consented to entry of this Judgment, it is,

Ordered, Adjudged and Decreed:

1. That Plaintiff is the owner of United States Letters Patent No. 2,212,183 and all rights thereunder.

2. That Defendant be enjoined from infringement of said Letters Patent.

3. That no costs or damages shall be awarded in favor of either of the parties hereto as against the other.

THOMAS P. THORNTON,
United States District Judge.

Dated: May 25th, 1950.

The undersigned hereby consent to the entry of the foregoing Judgment without costs and do hereby waive the making or filing of Findings of Fact and Conclusions of Law. The undersigned approve the form of Judgment.

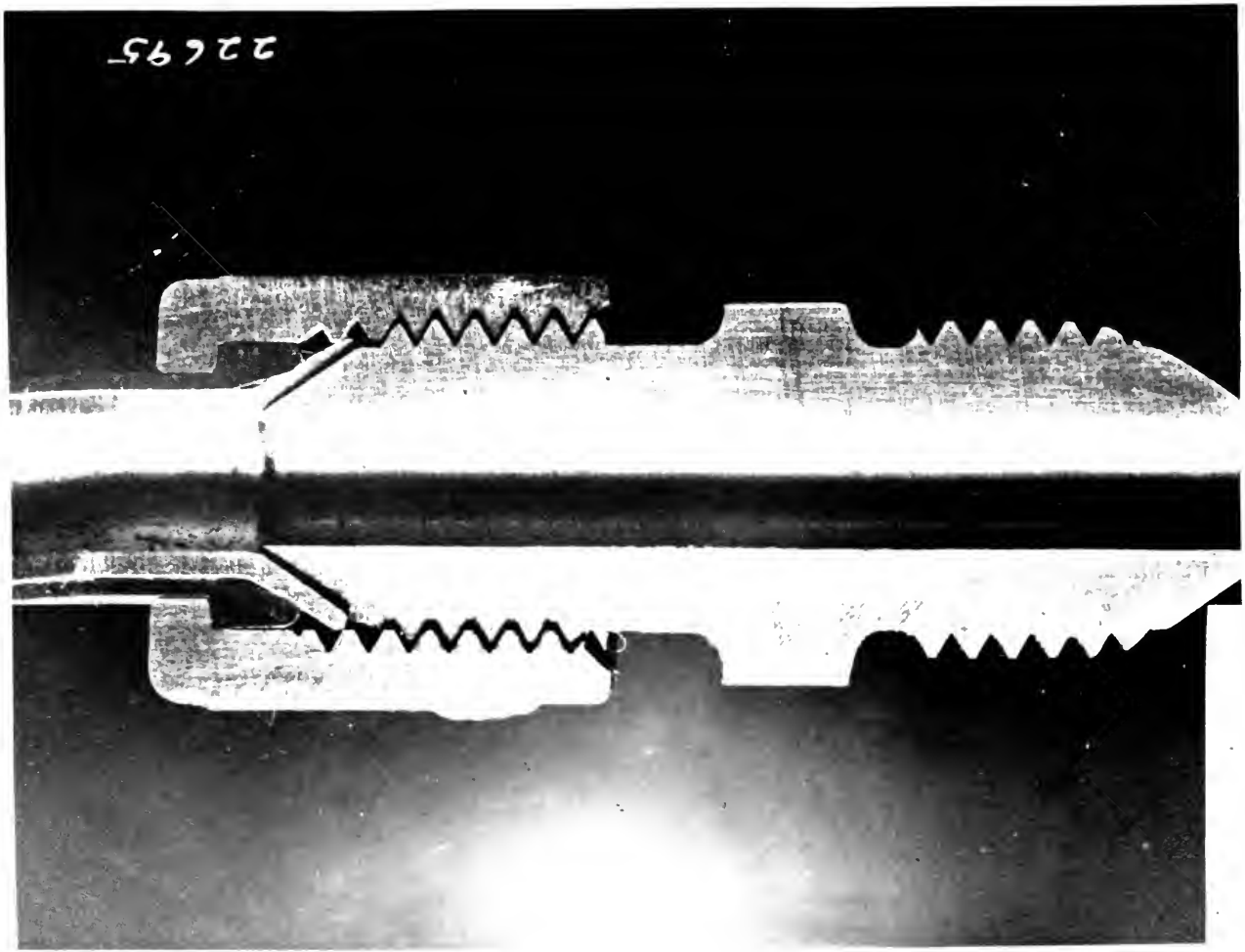
THE PARKER APPLIANCE COMPANY,

By /s/ PAUL MARCO,
Its Attorney.

V. L. GRAF COMPANY, INC.,

By /s/ V. L. GRAF.

[Certified true copy of original.]
Received in evidence June 21, 1950.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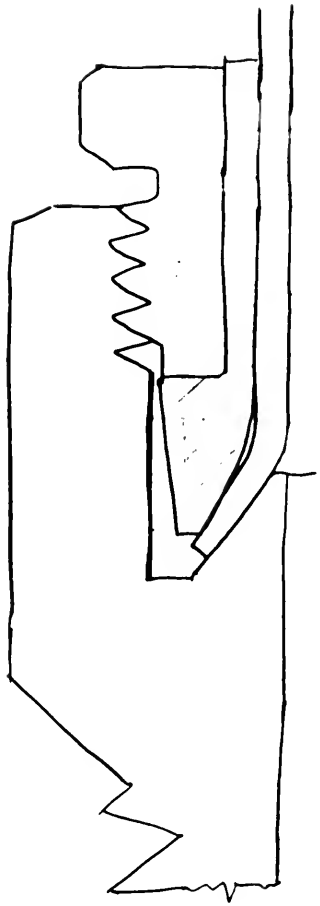


IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

DEFT'S
Plaintiff's Exhibit No. A

JUN 20 1950

JMW

region of corner

corner

2 angles or sleeve

Fig. 1

B

reversed and used body

Fig. 2

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA
Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B
Defts Exhibit No. B
JUN 20 1950

shoulder may be at slight angle

flare angle may be varied

Fig. 3

Fig. 4

JWW

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874 B
Parker v Collins - C. A. No. 8023-B

Plaintiffs Exhibit No. C

JUN 20 1950

C

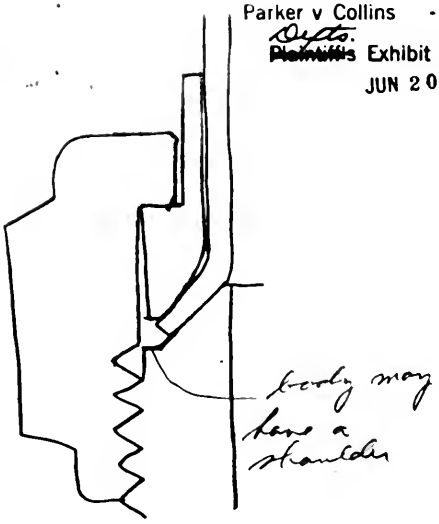


Fig. 5

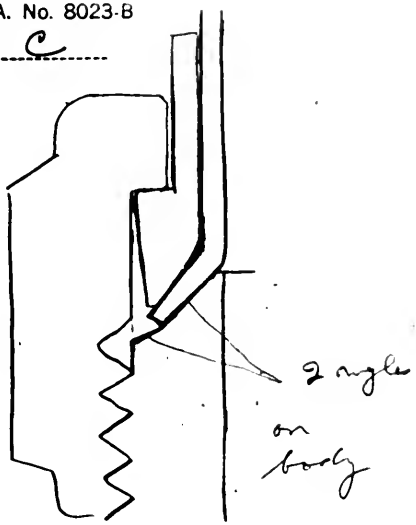


Fig. 6

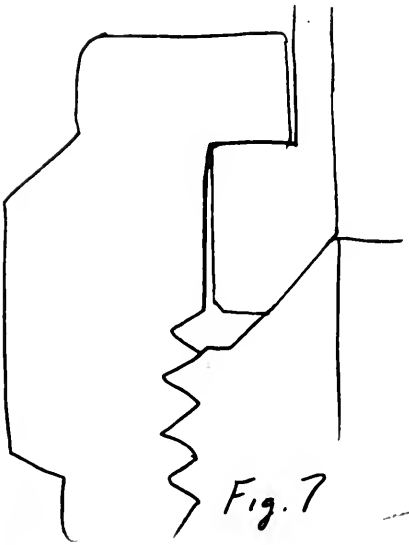


Fig. 7

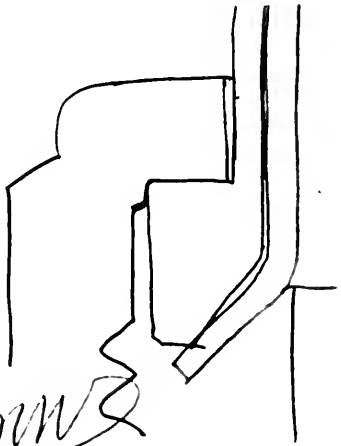
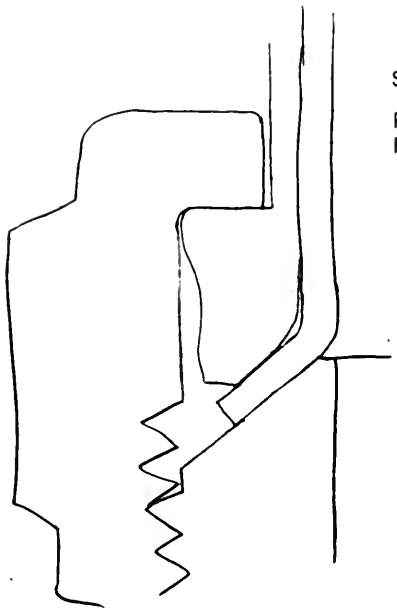


Fig 8

E



IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Delta
~~Plaintiff's~~ Exhibit No. E

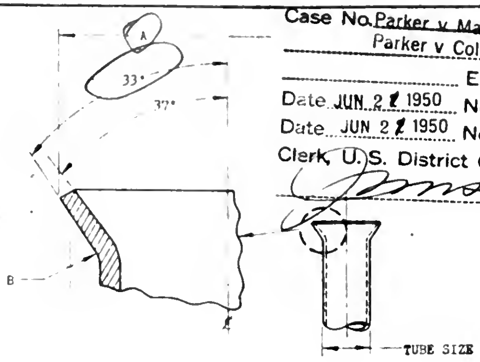
JUN 20 1950

Fig. 9.

1415

H

Case No. Parker v Masters · C. A. No. 7874-B
Parker v Collins · C. A. No. [illegible]
EXHIBITS H, H-1 & H-5
Date JUN 2? 1950 No. H, H-1 & IDENTIFICATION
Date JUN 2? 1950 No. H-5 IN EVIDENCE
Clerk, U.S. District Court, Sou. Dist. of Cal
[signature] Deputy Clerk



TUBE SIZE NOMINAL OD	A DIAMETER AL ALLOY TUBING		A DIAMETER STEEL TUBING		B ±.010 RADIUS
1/8	.224	+.000 -.010	.224	+.000 -.010	.032
3/16	.312	+.000 -.010	.290	+.000 -.010	.032
1/4	.359	+.000 -.010	.359	+.000 -.010	.032
5/16	.421	+.000 -.010	.421	+.000 -.010	.032
?/8	.4?4	+.000 -.010	.484	+.000 -.010	.046
1/2	.?56	+.000 -.010	.656	+.000 -.010	.062
5/8	.791	+.000 -.010	.791	+.000 -.010	.062
3/4	.937	+.000 -.010	.937	+.000 -.010	.078
1	1.187	+.000 -.015	1.187	+.000 -.015	.093
1-1/4	1.500	+.000 -.015	1.500	+.000 -.015	.093
1-1/2	1.721	+.000 -.015	1.721	+.000 -.015	.109
1-3/4	2.106	+.000 -.015	2.106	+.000 -.015	.109
2	2.356	+.000 -.015	2.356	+.000 -.015	.109
(1) 2-1/?	[illegible]	[illegible]	[illegible]	+.000 -.015	.109
(1) 3	3.??	[illegible]	3.??	[illegible]	.109

FOR USE WITH ANA STANDARD FLARED TUBE FITTINGS.
DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: ANGLES ±1/2°.

APPROVED 6 Jan 41 REVISED (1) 9 Dec 43 (2) 20 Feb 45 (3) ?? Aug 46 (4) 23 May 49

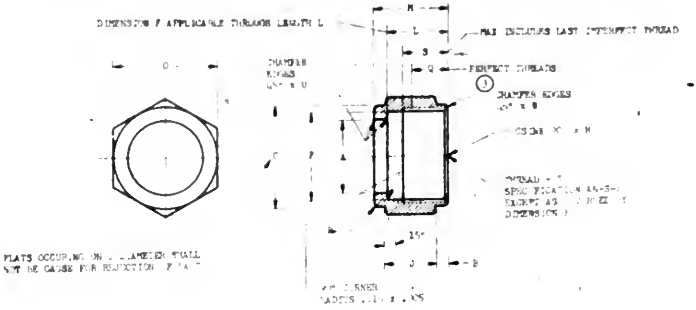
AIR FORCE - NAVY AERONAUTICAL DESIGN STANDARD

TUBING END - STANDARD DIMENSIONS FOR FLARED

AND10061

NOT A PART NUMBER

185



DASH NO. STEEL	DASH NO. AL ALLOY	TUBING OD	(a) THREAD T	(a) A +.003 -.000 DIA	B	C +.000 -.010 DIA	(a) F +.003 -.000 DIA	H DIA	J	L	M	N	Q MIN	R RAD	S +.015 -.005	U	O
2	2D	1/8	5/16-24NF-3	.180	[illegible]	.375	[illegible]	5/16	5/16	[illegible]	17/32	.010	[illegible]	1/32	[illegible]	[illegible]	[illegible]
3	3D	3/16	3/8-24NF-3	[illegible]	[illegible]	[illegible]	.334	3/8	3/8	[illegible]	19/32	.010	.282	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	1/4	7/16-20NF-3	[illegible]	[illegible]	[illegible]	[illegible]	7/16	13/32	.532	39/64	.010	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	5D	5/16	1/2-20NF-3	[illegible]	1/8	[illegible]	.451	1/2	31/64	[illegible]	43/64	.010	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	6D	3/8	9/16-18NF-3	[illegible]	[illegible]	.68	[illegible]	9/16	[illegible]	.603	[illegible]	[illegible]	.333	3/64	[illegible]	.010	[illegible]
8	8D	1/2	3/4-16NF-3	[illegible]	[illegible]	[illegible]	.68	[illegible]	[illegible]	.72	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.01	[illegible]
10	10D	5/8	7/8-14NF-3	[illegible]	[illegible]	[illegible]	.80	[illegible]	[illegible]	[illegible]	31/32	[illegible]	.461	[illegible]	[illegible]	[illegible]	[illegible]
12	12D	3/4	1-1/16-12N-3	[illegible]	[illegible]	1.270	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.010	.469	1/16	[illegible]	[illegible]	[illegible]
16	16D	1	1-5/16-12N-3	[illegible]	7/32	[illegible]	1.22	[illegible]	[illegible]	.862	[illegible]	.010	[illegible]	5/64	[illegible]	.01	[illegible]
20	20D	1-1/4	1-5/8-12N-3	1.347	[illegible]	2.000	1.521	1-5/8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3/32	[illegible]	[illegible]	[illegible]
24	24D	1-1/2	1-7/8-12N-3	[illegible]	[illegible]	2.250	1.771	1-7/8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
28	28D	1-3/4	2-1/4-12N-3	[illegible]	[illegible]	[illegible]	2.166	2-1/4	1	[illegible]	[illegible]	.015	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
32	32D	2	2-1/2-12N-3	2.1[illegible]	[illegible]	2.937	2.41	2-1/2	[illegible]	[illegible]	[illegible]	.015	[illegible]	[illegible]	.96	[illegible]	[illegible]
40	40D	2-1/2	3-12N-3	[illegible]	13/32	3.375	[illegible]	[illegible]	31/32	[illegible]	[illegible]	.015	.719	[illegible]	[illegible]	[illegible]	[illegible]
48	48D	3	3-1/2-12N-3	3.1[illegible]	[illegible]	[illegible]	[illegible]	3-1/2	1-1/16	1.452	[illegible]	.025	.781	7/64	[illegible]	[illegible]	[illegible]

(a) DIMENSIONS A, F, AND THREAD T SHALL BE CONCENTRIC WITHIN [illegible] FULL INDICATOR READING.

MATERIALS: AL ALLOY OR STEEL, BARS OR SHAPES, SEE PROCUREMENT SPECIFICATION.

FINISH: SEE PROCUREMENT SPECIFICATION.

EXAMPLES OF PART NUMBERS: [illegible] = NUT FOR [illegible] TUBE OD, AL ALLOY.
[illegible] = NUT FOR 1/4 TUBE OD, STEEL.

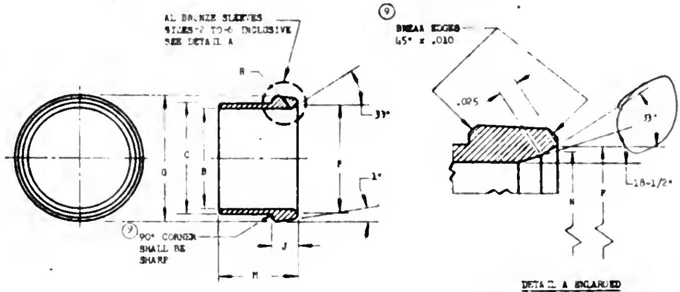
REMOVE ALL BURRS AND SHARP EDGES.

DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: FRACTIONS ±1/64, DECIMALS ±.005, ANGLES ±[illegible]

APPROVED [illegible] REVISED (1) 28 Jun 43 (2) 6 Jul 44 (3) 22 May 45

PROCUREMENT SPECIFICATION	AIR FORCE-NAVY AERONAUTICAL STANDARD	AN818
AN-F-360	NUT-COUPLING	

H-2



AN PART NO.			TUBING OD	(a) B +.003 -.000 DIA	(a) C +.000 -.003 DIA	(a) F DIA	(a) G +.000 -.003 DIA	J	M	N DIA REF AL BRONZE	R RAD	
STEEL	AL ALLOY	AL BRONZE									STEEL	AL ALLOY & AL BRONZE
AN819-2	-	AN819-2Z	1/8	.1[illegible]	.172	.205	.267	1/8	11/32	.190	1/32	-
AN819-3	-	AN819-3Z	3/16	[illegible]	.234	.267	.329	9/64	13/32	.25[illegible]	1/32	-
AN819-4	-	AN819-4Z	1/4	.255	.297	.315	.383	9/64	13/32	.302	1/32	-
AN819-5	-	AN819-5Z	5/16	.318	.366	.375	.445	5/32	7/16	.362	1/32	-
AN819-6	-	AN819-6Z	3/8	.380	.432	.441	.502	11/64	1/2	.424	3/64	-
AN819-8	AN819-8D	AN819-8Z	1/2	.505	[illegible]	.569	.682	7/32	9/16	-	1/16	1/16
AN819-10	AN819-10D	AN819-10Z	5/8	.631	.690	.705	.797	15/64	21/32	-	1/16	1/16
AN819-12	AN819-12D	AN819-12Z	3/4	.756	.826	.880	.972	17/64	11/16	-	5/64	5/64
AN819-16	AN819-16D	AN819-16Z	1	1.006	1.08[illegible]	1.130	1.222	9/32	25/32	-	3/32	3/32
AN819-20	AN819-20D	AN819-20Z	1-1/4	1.260	1.339	1.412	1.534	5/16	29/32	-	3/32	3/32
AN819-24	AN819-24D	AN819-24Z	1-1/2	1.510	1.609	1.630	1.784	11/32	1-1/8	-	7/64	7/64
AN819-28	AN819-28D	AN819-28Z	1-3/4	1.764	1.882	1.945	2.159	3/8	1-1/8	-	7/64	7/64
AN819-32	AN819-32D	AN819-32Z	2	2.014	2.159	2.195	2.409	13/32	1-3/16	-	7/64	7/64
(9) AN819-40	AN819-40D	AN819-40Z	2-1/2	2.516	2.6[illegible]	2.695	2.911	15/32	1-5/16	-	7/64	7/64
(9) AN819-48	AN819-48D	AN819-48Z	3	3.016	3.17[illegible]	3.195	3.411	17/32	1-3/8	-	7/64	7/64

(a) DIMENSIONS B, C, F, AND G CONCENTRIC WITHIN .005 FULL INDICATOR READING.

MATERIAL: STEEL: BARS
AL ALLOY: BARS, SHEET OR STRIP
ALUMINUM BRONZE: BARS OR RODS
SEE PROCUREMENT SPECIFICATION.

FINISH: SEE PROCUREMENT SPECIFICATION.

USAGE: USE STEEL SLEEVES WITH STEEL TUBING ONLY.
USE AL BRONZE SLEEVES WITH EITHER AL ALLOY OR STEEL TUBING.
USE AL ALLOY SLEEVES WITH AL ALLOY TUBING ONLY.

EXAMPLES OF PART NUMBERS: AN819-5 = SLEEVE; 5/16 TUBING OD, STEEL.
AN819-8D = SLEEVE; 1/2 TUBING OD, AL ALLOY.
AN819-5Z = SLEEVE; 5/16 TUBING OD, AL BRONZE.

REMOVE ALL BURRS AND SHARP EDGES.

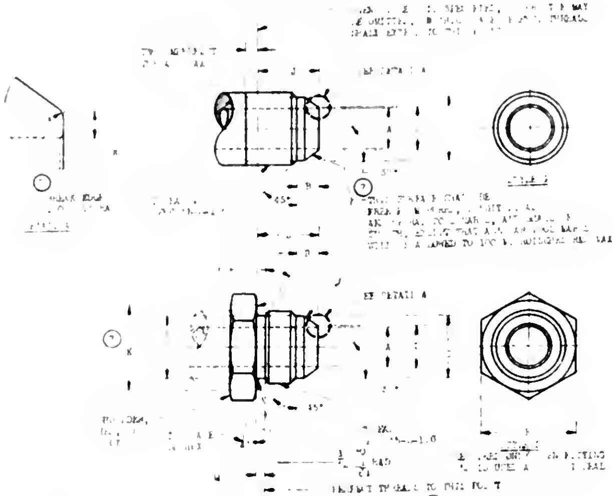
DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: FRACTIONS ±1/64, DECIMALS ±.005, ANGLES ±1/2°

LETTERS AN NEED NOT BE MARKED ON THIS PART.

APPROVED 13 Dec 40 REVISED (1) 5 Feb 41 (2) 8 Jul 42 (3) 20 Jul 43 (4) 24 Jul 44 (5) 1 Dec 47 (6) 2 Mar 48 (7) 18 May 48 (8) 15 Jun 48 (9) 23 May 49

PROCUREMENT SPECIFICATION	AIR FORCE-NAVY AERONAUTICAL STANDARD	AN819
AN-F-366	SLEEVE-COUPLING	

H-3



TUBE OD	(a) THREAD T	A	B	(a) C DIA	(a) D DIA	E		(a) F	(b) MAX		K		MIN
1/8	5/16-24 NF-3	.062	[illegible]	.151	[illegible]	.365	+.002 -.006	[illegible]	.005	.449	.500	[illegible]	.005
3/16	3/8-24 NF-3	.125	[illegible]	.213	.146	.62[illegible]	[illegible] -.006	.41[illegible]	.005	.4[illegible]9	.562	[illegible]	[illegible]
1/4	7/16-20 NF-3	.17[illegible]	.1[illegible]	.265	.185	.6[illegible]	+.00[illegible] -.006	.364	.005	.550	.625	[illegible]	[illegible]
5/16	1/2-20 NF-3	[illegible]	.19[illegible]	.4[illegible]7	.265	.750	+.003 -.006	.4[illegible]	.005	.550	.687	[illegible]	[illegible]
3/8	9/16-18 NF-3	.2[illegible]	.19[illegible]	.[illegible]2	.718	.813	+.003 -.006	.452	[illegible]	.556	.750	.08[illegible]	
1/2	3/4-16 NF-3	.3[illegible]1	[illegible]	.6[illegible]1	.476	1.000	+.003 -.006	.600	[illegible]	.5[illegible]	.[illegible]	[illegible]	[illegible]
5/8	7/8-14 NF-3	.4[illegible]	.266	.7[illegible]	.5[illegible]	1.125	+.00[illegible] -.0[illegible]	[illegible]	[illegible]	.[illegible]58	1.06[illegible]	[illegible]	[illegible]
3/4	1-1/16-12 N-3	[illegible]	[illegible]	.94[illegible]	.6[illegible]	1.3[illegible]5	[illegible]	[illegible]	[illegible]	.[illegible]64	1.[illegible]4	.12[illegible]	.022
1	1-5/16-12 N-3	.[illegible]44	[illegible]	1.195	[illegible]	1.625	+.008 -.016	[illegible]	[illegible]	.911	1.524	[illegible]	[illegible]
1-1/4	1-5/8-12 N-3	1.[illegible]	.367	1.[illegible]07	1.147	1.875	+.0[illegible] -.016	1.50[illegible]	.008	.958	1.833	.125	[illegible]
1-1/2	1-7/8-12 N-3	[illegible]	[illegible]	1.757	1.[illegible]	2.125	+.010 -.020	[illegible]	.008	1.[illegible]	2.093	[illegible]	[illegible]
1-3/4	2-1/4-12 N-3	1.[illegible]	.4[illegible]1	2.152	1.646	2.500	+.015 [illegible]	2.15[illegible]	.008	[illegible]	2.460	[illegible]	[illegible]
2	2-1/2-12 N-3	1.7[illegible]1	.461	2.[illegible]	[illegible]	2.750	+.015 [illegible]	[illegible]	[illegible]	1.553	[illegible]	[illegible]	.04[illegible]
2-1/2	3-12 N-3	[illegible]81	.395	2.[illegible]	2.380	3.250	[illegible]	[illegible]	.008	1.109	[illegible]	[illegible]	[illegible]
3	3-1/2-12 N-3	2.781	.395	3.302	2.680	3.7[illegible]	[illegible]	[illegible]581	.008	1.187	[illegible]718	[illegible]	[illegible]

(a) DIAMETERS C, F AND T (PITCH DIA) SHALL BE CONCENTRIC TO EACH OTHER [illegible] FULL INDICATOR READING.

(7) (b) [illegible] BETWEEN THREAD AND FACE OF [illegible] SHALL NOT EXCEED [illegible]

REMOVE ALL BURRS AND SHARP EDGES.

DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED. TOLERANCE ON ANGLES [illegible]

APPROVED 3 Feb [illegible] REVISED 27 Feb 51 [illegible] 23 May 49

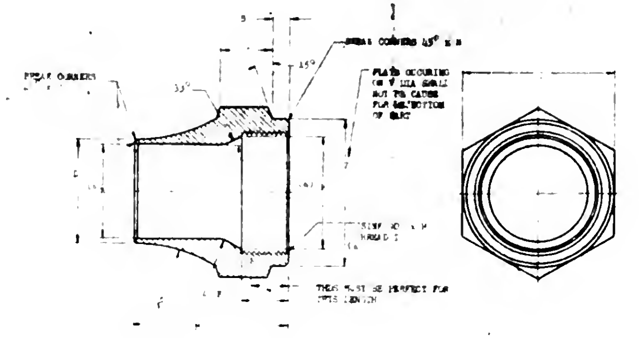
AIR FORCE-NAVY AERONAUTICAL DESIGN STANDARD

FITTING END-STANDARD DIMENSIONS FOR FLARED TUBE CONNECTION AND GASKET SEAL

AND10056

NOT A PART NUMBER

H-4



DASH NO. STEEL	DASH NO. AL ALLOY	TUBING OD	THREAD T	A DIA	[illegible]	(C)	D DIA	E RAD	F +.003 -.000 DIA	H DIA	J	L	M	N	[illegible]	R MAX	U	V +.000 -.010
[illegible]	[illegible]D	[illegible]	[illegible]-NF-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.272	5/16	[illegible]	[illegible]	27/32	.010	.220	[illegible]-11/32	.005	[illegible]
[illegible]	3D	[illegible]	[illegible]-24NF-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3/8	[illegible]	[illegible]	[illegible]	.010	[illegible]	1-25/32	[illegible]	[illegible]
[illegible]	4D	[illegible]	[illegible]-NF-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]/32	[illegible]	7/16	[illegible]	[illegible]	[illegible]	.010	[illegible]	1-3/8	[illegible]	.562
5	5D	[illegible]	[illegible]-20NF-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1-[illegible]/16	.010	.300	[illegible]	.005	.629
6	6D	[illegible]	[illegible]-18NF-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.385	1-3/32	[illegible]	[illegible]	[illegible]7/64	.010	.687
[illegible]	8D	[illegible]	[illegible]-16NF-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.438	1-[illegible]	[illegible]	[illegible]	[illegible]-5/8	.010	.875
1[illegible]	10D	[illegible]	[illegible]-14NF-3	.631	[illegible]	1.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]-1/16	.010	1.000
12	12D	[illegible]	1-1/16-12 N-3	[illegible]	[illegible]/16	1.250 +.003 -.006	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]-47/64	.010	1.250
16	16D	[illegible]	[illegible]-12 N-3	[illegible]	3/16	1.500 +.003	[illegible]	[illegible]	[illegible]	1-[illegible]/16	[illegible]	.625	1-[illegible]/16	[illegible]	[illegible]	2-11/16	.010	1.500
[illegible]	20D	1-[illegible]	1-[illegible]-12 N-3	[illegible]	[illegible]	[illegible] +.009 -.016	1.353	3/32	[illegible]	[illegible]-5/8	[illegible]	[illegible]	[illegible]-3/16	[illegible]	.500	2-13/32	.010	2.000
[illegible]	24D	[illegible]	[illegible]-12 N-3	[illegible]	[illegible]	[illegible] -.020	[illegible]	[illegible]/64	[illegible].91	1-7/8	[illegible]3/64	[illegible]	[illegible]	.010	[illegible]	2-[illegible]	.010	2.250
28	28D	1-[illegible]	[illegible]-12 N-3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.160	2-1/4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.625
32	[illegible]D	[illegible]	[illegible]-12 N-3	2.014	[illegible]	[illegible] -.020	[illegible]	[illegible]	[illegible]	[illegible]	59/64	[illegible]	[illegible]	[illegible]	[illegible]	3-[illegible]/32	[illegible]	[illegible]

(4) [illegible] AND THREAD [illegible] EACH OTHER WITHIN [illegible]

MATERIALS: [illegible] ALLOY, OR STEEL BARS OR SHAPES AS NOTED IN PROCUREMENT SPECIFICATION.

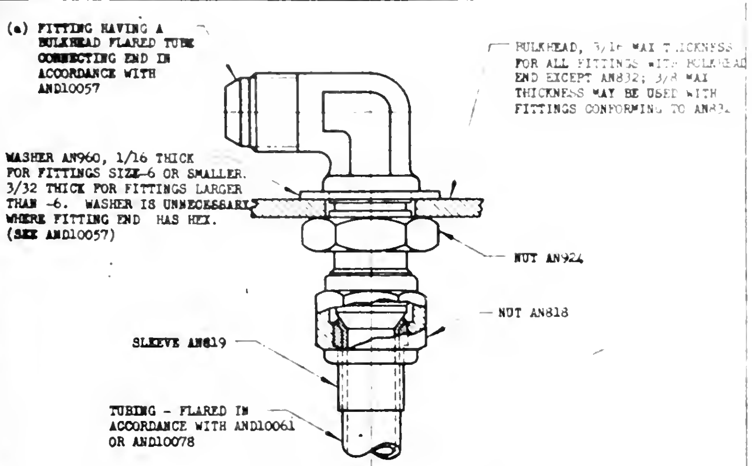
FINISH: FOR DETAILS SEE PROCUREMENT SPECIFICATION.

EXAMPLES OF PART NUMBERS: AN[illegible] = STEEL [illegible] FOR [illegible]
AN[illegible] = [illegible] FOR [illegible]

REMOVE ALL BURRS AND SHARP EDGES.
DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: FRACTIONS ±1/64, DECIMALS ±.00[illegible], ANGLES ±1/2°.

APPROVED 13 Dec 40 REVISED

PROCUREMENT SPECIFICATION	AIR FORCE-NAVY AERONAUTICAL STANDARD	AN817
AN-F-36	NUT-SLEEVE COUPLING	



BULKHEAD AND FLARED TUBE ASSEMBLY

TUBING OD INCHES	WRENCH TORQUE FOR TIGHTENING AN818 NUT (POUND INCH)					
	ALUMINUM ALLOY TUBING FLARE AND10061 OR AND10078		STEEL TUBING FLARE AND10061		ALUM ALLOY TUBING (FLARE AND10078) FOR USE ON OXYGEN LINES ONLY	
	MIN	MAX	MIN	MAX	MIN	MAX
1/8	- -	- -	- -	- -	- -	- -
3/16	- -	- -	30	70	- -	- -
1/4	40	65	50	90	- -	- -
5/16	60	80	70	120	100	125
3/8	75	125	90	150	- -	- -
1/2	150	250	155	250	- -	- -
5/8	200	350	300	400	- -	- -
3/4	300	500	430	575	- -	- -
1	500	700	550	750	- -	- -
1 1/4	600	900	- -	- -	- -	- -
1 1/2	600	900	- -	—	- -	- -
1 3/4	- -	- -	- -	- -	- -	- -
2	- -	- -	- -	- -	- -	- -

(a) ASSEMBLY OF FITTINGS HAVING THE CONNECTING END IN ACCORDANCE WITH AND10056 IS SIMILAR EXCEPT THAT THE END IS NOT USED THROUGH BULKHEADS. WRENCH TORQUES IN ASSEMBLING THE TUBING ARE THE SAME.

SHEET NO. 2 ADDED.

(3) SHEET NO. 3 ADDED.

APPROVED 19 Dec 44 REVISED (1) 1 Nov 45 (2) 7 Nov 46 (3) 16 ...

AIR FORCE

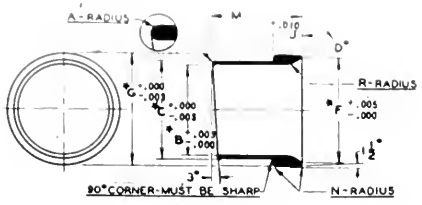
AIR FORCE-NAVY AERONAUTICAL DESIGN STANDARD

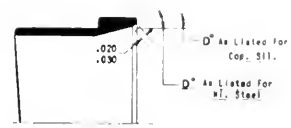
FITTINGS - INSTALLATION OF UNIVERSAL AND BULKHEAD FLARED TUBE

AND10064

(3) SHEET 1 OF 3 SHEETS

NOT A PART NUMBER





SIZES 2-8 COPPER SILICON SLEEVES ONLY.

* DIAMETERS TO BE CONCENTRIC WITHIN .005 FULL INDICATOR READING

DASH NOS.	COPPER SILICON / NICKEL STEEL	2 CS	3 CS	4 CS	5 CS	6 CS	7 CS	8 CS	10 CS	12 CS	16 CS	20 CS	24 CS	28 CS	32 CS
		2 NS	3 NS	4 NS	5 NS	6 NS	7 NS	8 NS	10 NS	12 NS	16 NS	20 NS	24 NS	28 NS	32 NS
TUBE O.D.		1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2
A		.011	.011	.011	.012	.013	.014	.014	.015	.018	.019	.020	.025	.030	.036
B		.130	.183	.266	.318	.380	.443	.505	.631	.756	1.006	1.257	1.512	1.757	2.012
C		.172	.234	.297	.359	.422	.497	.562	.890	.828	1.081	1.339	1.609	1.882	2.159
D	Cop. Sil.	25	20	15	12 1/2	12 1/2	25	30	30	30	30	30	30	30	30
	Ni. Steel	35 1/2	25 1/2	33	38	25	25	30	30	30	30	30	30	30	30
F		.195	.265	.310	.370	.448	.500	.588	.718	.875	1.125	1.406	1.640	1.837	2.187
E		.262	.325	.378	.441	.501	.564	.662	.808	.978	1.228	1.541	1.791	2.152	2.402
J		7/64	9/64	1/8	9/64	11/64	13/64	15/64	15/64	1/4	1/4	17/64	9/32	21/64	23/64
M		9/32	11/32	11/32	13/32	15/32	17/32	17/32	19/32	11/16	3/4	7/8	1	1 1/8	1 1/4
N		.016	.016	.016	.010	.010	.010	.016	.016	.023	.023	.023	.023	.023	.023
G	Cop. Sil.	—	—	—	—	—	1/16	1/16	1/16	5/64	3/32	3/32	7/64	7/64	7/64
	Ni. Steel	1/32	1/32	1/32	1/32	3/64	1/16	1/16	1/16	5/64	3/32	3/32	7/64	7/64	7/64
WTS. IN LBS.	COPPER SILICON	.002	.003	.004	.006	.008	.010	.015	.020	.036	.055	.076	.122	.180	.260
	NICKEL STEEL	.002	.003	.004	.006	.007	.010	.017	.021	.038	.055	.076	.123	.180	.260

ENGINEERING INFORMATION ONLY - Copper-Silicon (CS) sleeves shall be used with brass or aluminum alloy fittings.
Nickel steel (NS) sleeves shall be used with steel fittings and with steel fittings only.

MATERIALS - Copper-Silicon: Spec. QQ-C-591, or Aluminum-Bronze, Spec. QQ-B-666.
Nickel Steel: Spec. 57-107-17, minumim tensile strength 125,000 pounds per square inch.

FINISH - Copper-Silicon and nickel steel sleeves shall be cadmium plated, Spec. AN-QQ-P-421.
Nickel Steel sleeves shall be identified by a 1/8" wide black band around the sleeve at the midpoint.

EXAMPLE OF PART NO. - 811T-8CS = Sleeve, three-piece tube fitting, copper-silicon, 1/2" O.D. tube.

TOLERANCES: Fractions ±.016"; decimals ±.005"; angles ±1/2° unless specifically noted otherwise. Weight +10% maximum.

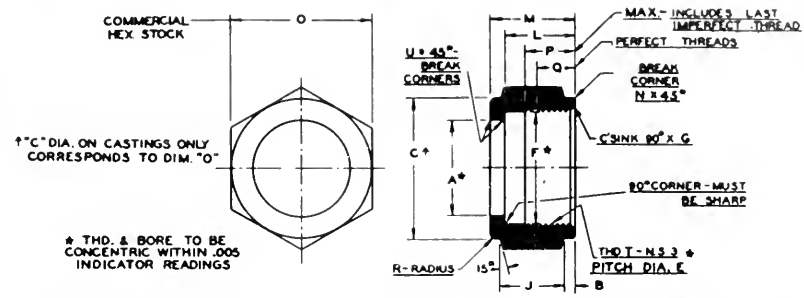
The above T Parker standards have been revised to eliminate interference of extreme tolerances when assembled with component parts. The above changes are to become effective only when the present tooling needs replacing.

Defendant's Exhibit I
June 21, 1950.

Issue Date		Sheet number
10-26-40	SLEEVE, TRIPLE (A.C. 811 TYPE)	811T

REVISED: 2-18-41; 6-2-42, 2-26-43

THE PARKER APPLIANCE COMPANY — Cleveland, Ohio, U. S. A.



DASH NUMBERS		2	3	4	6	6	7	8	10	12	16	20	24	28	32
	ALUM. ALLOY	3 0	3 0	4 0	5 0	6 0	7 0	8 0	10 0	12 0	16 0	20 0	24 0	28 0	32 0
	NICKEL STEEL	2 #3	3 #3	4 #3	5 #3	6 #3	7 #3	8 #3	10 #3	12 #3	16 #3	20 #3	24 #3	28 #3	32 #3
TUBE O.D.		1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2
THD. T		5/16-24	3/8 - 24	7/16 - 20	1/2 - 20	9/16 - 20	5/8 - 20	3/4 - 18	7/8 - 18	1 1/16-18	1 5/16-18	1 5/8 - 18	1 7/8 - 18	2 1/4 -12	2 1/2 -12
PITCH DIA. E		.2854	.3479	.4050	.4675	.5300	.5925	.7139	.8388	1.0161	1.2661	1.5786	1.8286	2.1955	2.4455
LIMITS		+.0024 -.0000	+.0024 -.0000	+.0026 -.0000	+.0026 -.0000	+.0030 -.0000	+.0030 -.0000	+.0030 -.0000	+.0036 -.0000	+.0040 -.0000	+.0040 -.0000	+.0043 -.0000	+.0043 -.0000	+.0049 -.0000	+.0049 -.0000
A	+.003 -.000	.177	.239	.302	.371	.437	.502	.567	.695	.831	1.086	1.399	1.819	1.887	2.184
B		1/16	3/32	3/32	3/32	1/8	1/8	1/8	1/8	1/8	5/32	1/4	9/32	5/16	11/32
C	+.005 -.000	.365	.427	.552	.615	.677	.740	.865	.990	1.177	1.490	1.927	2.240	2.815	2.827
F	+.005 -.000	.257	.330	.383	.446	.508	.571	.690	.815	.985	1.235	1.548	1.798	2.160	2.410
G		.332	.400	15/32	17/32	19/32	21/32	25/32	29/32	1 3/32	1 11/32	1 21/32	1 29/32	2 9/32	2 17/32
J		5/16	23/64	13/32	33/64	25/64	13/32	29/64	1/2	5/8	41/64	17/16	51/64	15/16	1 1/64
L	+.010	3/16	29/64	1/2	37/64	31/64	17/32	9/16	18/32	47/64	47/64	7/8	1 1/64	1 13/64	1 5/16
M		7/16	17/32	37/64	43/64	19/32	41/64	11/16	47/64	57/64	29/32	1 5/64	1 1/64	1 29/64	1 19/32
R		.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.015	.016
U		3/8	7/16	9/16	5/8	11/16	3/4	7/8	1	1 3/16	1 1/2	1 15/16	2 1/4	2 5/8	3
P		9/32	11/32	25/64	29/64	11/32	33/64	25/64	27/64	33/64	33/64	5/8	3/4	57/64	83/64
Q	±.005	.234	.296	.328	.390	.396	.711	.343	.374	.468	.468	.578	.702	.828	.921
W		1/32	1/32	1/32	1/32	3/64	3/64	3/64	3/64	1/16	5/64	3/32	3/32	3/32	7/64
U		.005	.005	.005	.005	.010	.010	.010	.010	.010	.010	.010	.010	.015	.015
WTS. 10 LBS.	8B433	.006	.010	.025	.033	.031	.035	.057	.087	.100	.182	.330	.540	.790	1.000
	ALUM. ALLOY	.002	.003	.007	.009	.009	.011	.017	.021	.032	.059	.110	.180	.260	.350
	NICKEL STEEL	.005	.009	.023	.030	.026	.032	.052	.060	.090	.150	.300	.490	.710	.900

ENGINEERING INFORMATION ONLY - Nickel steel (NS) nuts shall be used with steel fittings and with steel fittings only. Aluminum alloy nuts may be used with aluminum alloy and brass fittings.

MATERIALS - Aluminum Alloy: Spec. QQ-A-361, Condition T, Cold Rolled, or Spec. 57-153, Grade I, Forged.
Brass: Spec. QQ-B-611, Cold Drawn, or Spec. QQ-B-691, Composition #2, Casting.
Nickel Steel: Spec. 87-107-17, minimum tensile strength 125,000 pounds per square inch

FINISH - Nickel steel parts shall be cadmium plated, Spec. AN-QQ-P-421
Aluminum alloy parts shall be anodized, Spec. AN-QQ-A-696

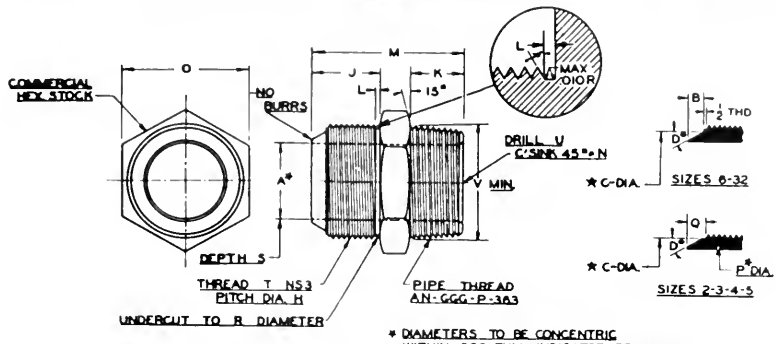
EXAMPLE OF PART NO. - 811BT-12 = Nut, three-piece tube fitting, brass, 3/4" O.D. tube.

TOLERANCES: Fractions ±.015", decimals ±.005", angles ±1/2°, unless specifically noted otherwise. Weight +10% maximum

The above BT Parker standards have been revised to eliminate interference of extreme tolerances when assembled with component parts. The above changes are to become effective only when the present tooling needs replacing.

Issue Date		Sheet Number
10-28-40	NUT, TRIPLE (A. C. 811 TYPE)	811BT

THE PARKER APPLIANCE COMPANY — Cleveland, Ohio, U. S. A.



* DIAMETERS TO BE CONCENTRIC WITHIN .005 FULL INDICATOR READING

DASH NUMBERS	BRASS	2	3	4	5	6	7	8	10	12	18-12	16	20	24	28	32
	ALUM. ALLOY	2 D	3 D	4 D	5 D	6 D	7 D	8 D	10 D	12 D	18-12 D	16 D	20 D	24 D	28 D	32 D
	NICKEL STEEL	2 #3	3 #3	4 #5	5 #5	6 #5	7 #5	8 #5	10 #5	12 #5	18-12 #5	16 #5	20 #5	24 #5	28 #5	32 #5
TUBE O. D.		1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1	1	1 1/4	1 1/2	1 3/4	2
PIPE THREAD		1/8	1/8	1/8	1/8	1/4	1/4	3/8	1/2	3/4	3/4	1	1 1/4	1 1/2	1 1/2	2
THD. T		5/16 - 24	3/8 - 24	7/16 - 20	1/2 - 20	9/16 - 20	5/8 - 20	3/4 - 18	7/8 - 18	1 1/16-18	5/16-18	5/16 - 18	5/8 - 14	7/8 - 14	1 1/4 - 12	2 1/2-12
PITCH DIA. H		.2854	.3479	.4050	.4675	.5300	.5925	.7139	.8389	1.016	1.266	1.266	1.5786	1.8286	2.1959	2.9459
LIMITS		+.0000 -.0024	+.0000 -.0024	+.0000 -.0026	+.0000 -.0026	+.0000 -.0030	+.0000 -.0030	+.0000 -.0036	+.0000 -.0040	+.0000 -.0040	+.0000 -.0040	+.0000 -.0040	+.0000 -.0062	+.0000 -.0062	+.0000 -.0069	+.0000 -.0069
A +.003 -.020		.070	.120	11/64	15/64	19/64	11/32	25/64	21/64	39/64	27/32	27/32	5/64	5/16	35/64	25/32
B +.000 -.020						9/64	5/32	5/32	3/16	7/32	7/32	7/32	1/4	1/4	9/32	5/16
C +.000 -.003		.248	.311	.362	.425	.469	.525	.616	.743	.900	1.150	1.150	1.431	1.665	1.978	2.212
D		37 1/2°	37 1/2°	35°	25°	25°	25°	30°	30°	30°	30°	30°	30°	30°	30°	30°
J ± .010		3/8	7/16	1/2	9/16	15/32	1/2	17/32	19/32	23/32	27/32	23/32	7/8	1	1 5/32	1 9/32
K		3/8	3/8	3/8	3/8	9/16	9/16	9/16	3/4	3/4	3/4	15/16	15/16	15/16	15/16	1 1/8
L +.015 -.000		.063	.063	.075	.075	.075	.075	.083	.083	.107	.107	.107	.107	.107	.125	.125
M ± 1/64		15/16	1 1/32	1 1/8	1 7/32	1 9/32	1 5/16	1 11/32	1 19/32	1 3/4	2 29/32	1 31/32	2 3/16	2 7/16	2 23/32	3 3/16
N		.010	.010	1/64	1/64	1/64	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/16	5/64
Q		7/10	7/16	7/16	1/2	9/16	5/8	3/4	7/8	1 1/8	1 1/8	1 1/8	1 11/16	2	2 3/8	2 5/8
P ± .003		.086	.136	.188	.250											
Q +.010 -.000		9/64	5/32	11/64	11/64											
R -.005		.256	.319	.370	.433	.495	.558	.876	.801	.968	1.218	1.218	1.530	1.760	2.140	2.390
S		THRU	THRU	THRU	THRU	THRU	THRU	THRU	THRU	THRU	31/32	THRU	THRU	THRU	1 1/2	THRU
U											3/4				1 1/2	
Y		.418	.418	.418	.418	.557	.557	.691	.862	1.072	1.072	1.342	1.685	1.924	1.924	2.309
WTS. IN LBS.	BRASS	.027	.031	.035	.041	.054	.058	.093	.155	.270	.338	.406	.610	.900	1.210	1.900
	ALUM. ALLOY	.008	.010	.011	.013	.017	.018	.031	.049	.087	.110	.135	.203	.300	.420	.630
	NICKEL STEEL	.023	.029	.031	.038	.048	.051	.088	.181	.230	.285	.384	.550	.810	1.120	1.710

ENGINEERING INFORMATION ONLY - Use Nut 811BT (Proper Dash No.) and sleeve 811T (Proper Dash No.)
Nickel steel (NS) fittings, nuts, and sleeves shall be used on all steel tubing and on steel tubing only.

MATERIALS - Aluminum Alloy: Spec. QQ-A-361, Condition T, Cold Rolled, or Spec. 57-163, Grade 1, Forged.
Brass: Spec. QQ-B-611, Cold Drawn, or Spec. QQ-B-691, Composition #2, Casting.
Nickel Steel: Spec. 57-107-17, minimum tensile strength 125,000 pounds per square inch.

FINISH - Steel parts shall be cadmium plated, Spec. AN-QQ-P-421.
Aluminum alloy parts shall be anodized, Spec. AN-QQ-A-696
Inside of all fittings shall be free of globules of metal and foreign matter.

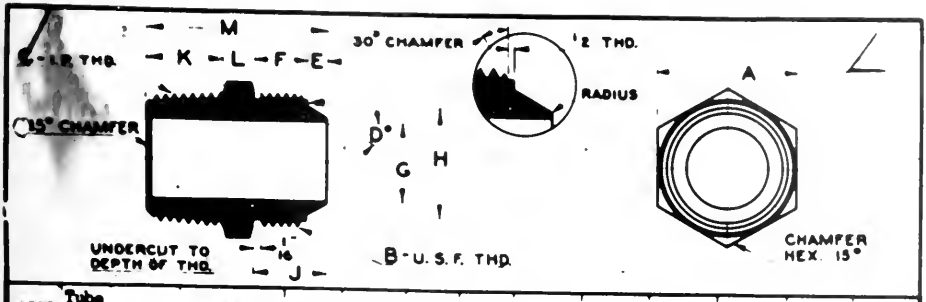
EXAMPLE OF PART NO. - 811FT-4O = Nipple, three-piece tube fittings, aluminum alloy, 1/4" O.D. tube to 1/8" ext. pipe thd.

TOLERANCES: Fractions ±.015", decimals ±.005", angles ±1/2°; unless specifically noted otherwise. Weight +10% maximum.

The above FT Parker standards have been revised to eliminate interference of extreme tolerances when assembled with component parts. The above changes are to become effective only when the present tooling needs replacing.

Issue Date		Sheet Number
10-26-40	NIPPLE, TRIPLE (A. C. 811 TYPE)	811FT

REVISED: 1-18-41; 6-2-42



SIZE	Tube Wall	A	B	C	D	E	F	G	H *	J	K	L	M
2	.080	7/16	5/16 - 24	1/8	37 1/2°	5/64	19/64	.070	.210	3/8	3/8	3/16	15/16
3	.080	7/16	3/8 - 24	1/8	37 1/2°	3/32	11/32	.120	.290	7/16	3/8	7/32	1 1/32
4	.080	7/16	7/16 - 20	1/8	35°	7/64	25/64	11/64	.335	1/2	3/8	1/4	1 1/8
5	.080	1/2	1/2 - 20	1/8	35°	7/64	29/64	15/64	.395	9/16	3/8	9/32	1 7/32
6	.035	9/16	9/16 - 20	1/4	25°	9/64	21/64	19/64	.469	15/32	1/2	1/4	1 7/32
7	.050	5/8	5/8 - 20	1/4	25°	5/32	11/32	11/32	.525	1/2	1/2	1/4	1 1/4
8	.050	3/4	3/4 - 18	3/8	30°	5/32	3/8	25/64	.618	17/32	9/16	1/4	1 11/32
9	.050	13/16	13/16 - 18	3/8	30°	11/64	25/64	29/64	.681	9/16	9/16	1/4	1 3/8
10	.060	7/8	7/8 - 18	1/2	30°	3/16	13/32	31/64	.743	19/32	11/16	1/4	1 15/32
11													
12	.065	1 1/8	1 1/16 - 14	3/4	30°	7/32	1/2	39/64	.900	23/32	3/4	9/32	1 11/16
14	.070	1 1/4	1 3/16 - 14	3/4	30°	7/32	1/2	23/32	1.025	23/32	3/4	9/32	1 11/16
16	.070	1 3/8	1 5/16 - 14	1	30°	7/32	1/2	27/32	1.150	23/32	13/16	5/16	1 27/32
18	.080	1 9/16	1 1/2 - 14	1	30°	1/4	9/16	61/64	1.306	13/16	13/16	5/16	1 15/16
20	.080	1 11/16	1 5/8 - 14	1 1/4	30°	1/4	5/8	1 5/64	1.431	7/8	15/16	3/8	2 3/16
24	.090	2	1 7/8 - 14	1 1/2	30°	1/4	3/4	1 5/16	1.665	1	15/16	1/2	2 7/16
28													
32	.100	2 5/8	2 1/2 - 12	2		30°	5/16	31/32	1 25/32	2.212	1 9/32	1 1/8	25/32	3 3/16

CHANGES			CHANGES		
	No.	Change		No.	Change

Defendant's Exhibit L
June 21, 1938.

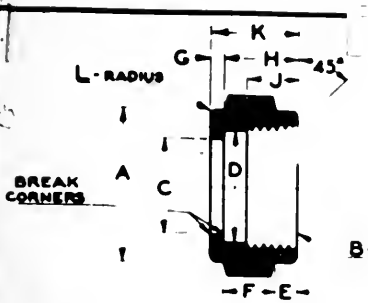
VAULT COPY
DO NOT USE

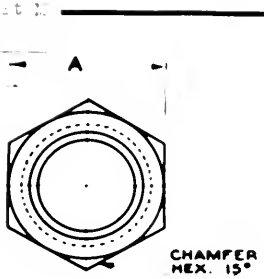
* ± .031 Tolerance

The Drawing is the property of the Parker Appliance Co. and is to be returned upon request.

Addressed to _____ Date _____

Issued 2 18 35	Name STANDARD TRIPLE COUPLING "FT" DIMENSIONS	Drawing No.
Revised	Parker Appliance Company Cleveland, Ohio	2-1835





M

SIZE	A	B	C *	D *	E	F	G	H	J	K	L
2	3/8	5/16 - 24	.177	.267	1/16	9/32	3/64	23/64	5/16	13/32	1/32
3	7/16	3/8 - 24	.239	.330	3/32	5/16	1/16	27/64	3/8	31/64	1/32
4	9/16	7/16 - 20	.302	.393	3/32	3/8	5/64	15/32	13/32	35/64	1/32
5	5/8	1/2 - 20	.371	.446	3/32	7/16	3/32	1/2	7/16	19/32	1/32
6	11/16	9/16 - 20	.437	.508	1/8	11/32	3/32	29/64	13/32	35/64	3/64
7	3/4	5/8 - 20	.502	.571	1/8	3/8	3/32	33/64	13/32	39/64	3/64
8	7/8	3/4 - 18	.567	.690	1/8	7/16	1/8	35/64	7/16	43/64	3/64
9	15/16	13/16 - 18	.630	.752	1/8	7/16	1/8	9/16	7/16	11/16	1/16
10	1	7/8 - 18	.695	.815	1/8	15/32	1/8	37/64	15/32	45/64	1/16
11											
12	1 3/16	1 1/16 - 14	.831	.995	1/8	9/16	1/8	45/64	9/16	58/64	1/16
14	1 3/8	1 3/16 - 14	.961	1.110	1/8	9/16	1/8	45/64	9/16	58/64	1/16
16	1 1/2	1 5/16 - 14	1.086	1.235	5/32	9/16	1/8	45/64	19/32	58/64	5/64
18	1 11/16	1 1/2 - 14	1.208	1.423	7/32	9/16	1/8	51/64	5/8	59/64	5/64
20	1 15/16	1 5/8 - 14	1.344	1.548	1/4	5/8	5/32	55/64	11/16	1 1/64	3/32
24	2 1/4	1 7/8 - 14	1.614	1.798	9/32	3/4	3/16	1 1/64	13/16	1 13/64	3/32
28											
32	2 15/16	2 1/2 - 12	2.164	2.410	11/32	15/16	7/32	1 19/64	1	1 38/64	7/64

CHANGES			CHANGES		
Date	No.	Change	Date	No.	Change

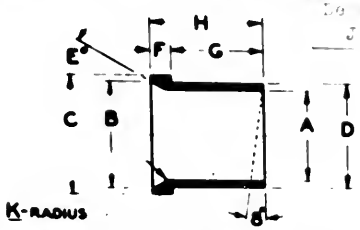
VAULT COPY
DO NOT USE

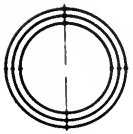
* ± .001 Tolerance ‡ +.002 −.000 Tolerance

Assigned to _____ Date _____

Issued 2-18-35	Name STANDARD TRIPLE COUPLING NUT DIMENSIONS	Drawing No.
Revised	Parker Appliance Company Cleveland, Ohio	2-1835-1

N





SIZE	Tube Wall	A ‡	B *	C ●	D *	E	F	G	H	K
2	.080	.129	.195	.264	.172	35 1/2°	3/32	15/32	9/16	1/32
3	.080	.192	.265	.327	.234	35 1/2°	7/64	33/64	5/8	1/32
4	.080	.254	.310	.390	.297	38°	7/64	37/64	11/16	1/32
5	.080	.317	.370	.448	.366	38°	1/8	5/8	3/4	1/32
6	.095	.380	.444	.508	.432	25°	9/64	39/64	3/4	3/64
7	.050	.442	1/2	.566	.497	25°	5/16	5/8	13/16	1/16
8	.050	.506	19/32	.665	.562	30°	5/16	11/16	7/8	1/16
9	.050	.568	21/32	.747	.625	30°	3/16	3/4	15/16	1/16
10	.060	.681	28/32	.810	.690	30°	3/16	25/32	31/32	1/16
11										
12	.065	.756	7/8	.980	.821	30°	7/32	31/32	1 3/16	5/64
14	.070	.881	1	1.105	.956	30°	7/32	1 5/32	1 3/8	5/64
16	.070	1.006	1 1/8	1.230	1.081	30°	7/32	1 5/32	1 3/8	5/32
18	.080	1.132	1 9/32	1.418	1.208	30°	1/4	1 3/16	1 7/16	5/32
20	.080	1.260	1 13/32	1.548	1.340	30°	1/4	1 3/16	1 7/16	5/32
24	.090	1.510	1 41/64	1.798	1.610	30°	9/32	1 9/32	1 9/16	7/64
28										
32	.100	2.014	2 3/16	2.405	2.160	30°	11/32	1 3/8	1 23/32	7/64

CHANGES			CHANGES		
Date	No.	Change	Date	No.	Change

* ± .001 Tolerance
‡ ± .0015 Tolerance
● +.000 −.002 Tolerance

This Drawing is the property of the Parker Appliance Co. and is to be returned upon request.

Assigned to _____ Date _____

Issued 2/18/35	Name STANDARD TRIPLE COUPLING SLEEVE DIMENSIONS	Drawing No. 2-1835-2
Revised	Parker Appliance Company Cleveland, Ohio	

SLEEVE HEAD EXPANSION TESTS

TRANSFERRED 6-20-50 S

SPECIMEN #	SIZE	METAL IN TOOL	BODY	NUT	SLEEVE	IN/LBS TORQUE	INITIAL A	INITIAL B	INITIAL C	A AFTER ASSEMBLY	B AFTER ASSEMBLY	C AFTER ASSEMBLY	EXPANSION AT A	EXPANSION AT B	EXPANSION AT C	HOW DONE
1	-8	DURAL	DURAL	DURAL	DURAL	200	.681	.678	.675	.6813	.6805	.678	.0003	.0025	.002	PUSHED
2	-8	DURAL	DURAL	DURAL	DURAL	200	.680	.678	.676	.6805	.680	.678	.0005	.002	.002	PULLED
3	-8	DURAL	DURAL	DURAL	DURAL	200	.6805	.678	.676	.6805	.6805	.67725	.000	.0025	.00125	PULLED
4	-8	DURAL	DURAL	DURAL	DURAL	200	HOLE OFF	.677	HOLE OFF	HOLE OFF	.6795	HOLE OFF	—	.0028	—	PULLED
5	-8	DURAL	DURAL	DURAL	DURAL	200	.680	.676	.675	.680	.67975	.6785	.000	.00275	.0035	PUSHED
6	-8	DURAL	DURAL	DURAL	DURAL	200	.6815	.6779	.6750	.6815	.678	.6787	.000	.0001	.0007	PUSHED
SAME						350				.682	.679	.6808	.001	.0001	.0008	"
SAME						600				.6815	.6823	.686	.000	.0044	.006	"
7	-8	DURAL	DURAL	DURAL	DURAL	400	.679	.6765	.675	.683	.687	.709	.004	.0205	.029	PUSHED
10	-6	DURAL	DURAL	DURAL	AL BRONZE	1/2	.4975	.4952	.4935	.4975	.499	.498	.000	.0023	.0045	PULLED
11	-6	DURAL	DURAL	DURAL	AL BRONZE	1/2	.4975	.4975	.494	.4985	.4975	.4974	.000	.001	.0034	PULLED
12	-6	DURAL	DURAL	DURAL	AL BRONZE	150	.4985	.495	.491	.499	.4961	.4941	.0005	.0015	.0034	PULLED
35	-8	1935	PARKER	DURAL	——	250	.6855	.6855	.6855	.6855	.6845	.6805	.000	.005	.006	PULLED
36	-8	"	"	"	—	250	.6842	.6842	.6842	.6842	.6826	.680	.000	.0044	.0058	PULLED
STEEL 1	-8	STEEL	STEEL	STEEL	STEEL	500	.678	.674	.673	.6845	.6845	.680	.0065	.0155	.017	PULLED
STEEL 2	-8	STEEL	STEEL	STEEL	STEEL	250	.679	.677	.675	.679	.6855	.676	.000	.0075	.011	PULLED

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters - C. A. No. 7874-B
Parker v Collins - C. A. No. 8023-B

Deft's Exhibit No. S

JUN 21 1950

DEFENDANT'S EXHIBIT RR

Department of Commerce
United States Patent Office

To all persons to whom these presents shall come, Greeting:

This Is to Certify that the annexed is a true copy from the records of this office of the File Wrapper and Contents, in the matter of the Letters Patent of Arthur L. Parker, Number 2,212,183, Granted August 20, 1940, for Improvement in Tube Couplings.

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this second day of May, in the year of our Lord one thousand nine hundred and forty-nine and of the Independence of the United States of America the one hundred and seventy-third.

/s/ LAWRENCE C. KINGSLAND,
Commissioner of Patents.

Attest:

/s/ C. W. SUTTON,
Acting Chief of Division.

Defendant's Exhibit RR—(Continued)

and to transact all business in the Patent Office connected therewith.

/s/ ARTHUR L. PARKER,
Inventor's Full Name.

Specification

To all whom it may concern:

Be it Known, That I, Arthur L. Parker, a citizen of the United States, residing at Cleveland in the County of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Tube Coupling of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

CJD/rbf

Arthur L. Parker

Tube Coupling

The present invention relates to new and useful improvements in tube couplings, and more particularly to improvements in couplings for clamping the flared ends of metal tubes such as are typified in U. S. Letters Patents to Arthur L. Parker, 1,893,442 and 1,977,240 of January 3, 1933, and October 16, 1933, respectively.

An object of the invention is to provide a tube coupling wherein the coupling members are so constructed and dimensioned that the flared end of the tube is firmly contacted with throughout the

Defendant's Exhibit RR—(Continued)

greater portion of the flared end so as to provide a tight and efficient seal.

A further object of the invention is to provide a tube coupling of the above type wherein the outer clamping member engaging the flared end of the tube is so dimensioned and shaped that contact is first made at the free end of the clamping member whereby the clamping member is caused to expand, thus bringing the entire clamping surface into intimate contact with the outer surface of the flared end of the tube with a resulting tight and efficient seal.

A still further object of the invention is to provide a coupling of the above type wherein the clamping member engaging the outer surface of the flared end of the tube consists of an inner and an outer sleeve, and wherein the clamping end of the inner sleeve which contacts with the flared end of the tube is so shaped as to be free from radial contact with the outer sleeve when the coupling members are in firm gripping contact with said flared end of the tube.

With the above and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a central longitudinal section illustrating the invention.

Figure 2 is an enlarged fragmentary section illus-

Defendant's Exhibit RR—(Continued)

trating the initial engagement of the sleeve with the external flared end surface of the tube.

Figure 3 is a view similar to Figure 2 and illustrates the ultimate clamping contact of the sleeve and clamping surfaces.

The improved coupling consists of a male member 5, having a projecting portion 6 provided with a tapered seat 7. The tube to be clamped is indicated at 8, and this tube is flared at its end, by a suitable flaring tool, as indicated at 9. Any suitable flaring tool may be used to give to the inner face 10 of the flared end of the tube an angular positioning, substantially the same as the angle of the seat 7 against which it is to be clamped. This flaring of the end of the tube thins the tube so that it decreases in thickness from the point of commencement to the extreme outer end of the flared portion. Thus the outer surface 11 of the flared *end** of the tube bears angular relation to the inner surface 10 as will be readily observed by reference to the dotted lines a, b forming continuations of said surfaces in Figures 2 and 3. In practice, the male member extension surface 7 and the flared end inner surface may be disposd at an angle of approximately thirty degrees with respect to the coupling axis, whereas the flared end outer surface is disposed at a more acute angle approximating twenty-eight degrees.

The coupling includes a female member formed in two sections. The outer section or clamp nut

[*Correction initialed per B.]

Defendant's Exhibit RR—(Continued)

12 is in the form of a sleeve having internal threads 13 adapted to engage the external threads 14 on the male member 5, and inwardly directed clamping shoulder 15. The female coupling member also includes an inner clamping sleeve 16 which has a telescoping connection with the outer sleeve 12, and the inner sleeve is provided with a head 17, the inner face of which is formed with a flared portion 18 adapted ultimately to have full surface contact with the outer surface 11 of the flared end 9 of the tube as shown in Figure 3 of the drawing. It will be observed by reference to the dotted line extension c in Figure 2 of the drawing that the flared surface 18 is formed so as to normally bear more acute angular relation to the coupling axis than does the flared tube end outer surface 11 which it is adapted to engage in clamping relation. Thus, during the assembling and clamp-setting of the coupling the extreme end or nose 19 of the inner sleeve head initially engages said outer surface 11. The head 17 includes a clamping shoulder 20 adapted to receive the longitudinal thrust imparted by the clamping shoulder 15 of the clamp nut or outer sleeve member 12, and the external wall of the nose is slightly tapered as at 21 so as to form a wedge-shaped clearance between said wall and the adjacent internal wall of the member 12. By reference to the dotted line extension d in Figures 2 and 3 of the drawing the angular position of the wall surface 21 will be clearly discernible.

At the base of the tapered surface 7 of the male extension 6 the surface flares abruptly as at 22 so as to form an abutment for the flared end 9 of the

Defendant's Exhibit RR—(Continued)

tube 8 without providing a positive limiting stop. The outer end of the inner sleeve 16 terminates in an angularly disposed edge 23, that is, the sleeve terminus is not disposed in a line truly transverse or in right angular relation to the axis of the tube 8. By thus forming the tube end, bending strains or vibrations set up in the tube 8 are not localized at a single point, across the diameter, or in the length of said tube.

In Figure 2 of the drawing, partial assembly of the coupling is illustrated, and in Figures 1 and 3 complete assembly or the fully clamped condition of the parts is shown. It will be observed by reference to these figures that during the assembly of the coupling the nose 19 alone first contacts the outer surface 11 of the tube flare, and upon continued application of end thrust by the screwing on of the member 12 and engagement of the clamping shoulders 15 and 20, the head 17 will be spread or displaced radially outwardly to store gripping tension in said head and *move forwardly along the flared end of the tube to** cause the clamping surfaces 11, 18 and 7, 10 to tightly contact throughout the whole of their respective areas. During the displacement or outward spreading of the head 17 the wall 21 thereof will approach the adjacent wall of the sleeve member 12, but the degree of taper of said head wall is such that it will never contact and bind against said sleeve member wall. [Insert C1.]

[*Correction initialed per B.]

Defendant's Exhibit RR—(Continued)

With the coupling parts proportioned and arranged as herein described, remarkably better results in the way of efficient clamping are obtained than have been obtainable heretofore. Wider seating areas are provided, all danger of the inner sleeve head sticking in the outer sleeve or nut is avoided, and a measure of spring tension is stored in the sleeve head 17 by the spreading thereof which is found to be very effective in aiding retention of the desired clamped relation of the tube flare surfaces and the surfaces which they engage.

While I have illustrated the invention embodied in a tube coupling wherein the seat against which the flared end of the tube is clamped is in the form of a male member and the nut cooperating with the inner sleeve is in the form of a female member, it is obvious that these parts may be reversed and the clamping seat formed of a female member while the sleeve is forced against the tube end by a male member. It is also obvious that minor changes in the details of construction and the shaping of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. A tube coupling for clamping the flared end of a tube comprising coupling members having a threaded engagement, one of said coupling members having a tapered seat adapted to extend into the tube and with which the flared end makes contact, the other coupling member including an inner

Defendant's Exhibit RR—(Continued)

against which said outer sleeve contacts, said head having the inner surface thereof flared so that the initial contact of said head with the flared end of the tube is at the free end of said head whereby during the clamping action said head will be expanded and will be brought into intimate contact with the outer surface of the flared end of the tube throughout substantially the entire extent of said flared surface on the sleeve head, the outer face of said head being shaped so that the free end of the head is out of contact with the outer sleeve at all times, whereby the clamping force of the seat against the tube end is determined by the spring tension of the metal forming said head.

5. A tube coupling for clamping the flared end of a tube comprising coupling members having a threaded engagement, one of said coupling members having a tapered seat adapted to extend into the tube and with which the flared end makes contact, the other coupling member including a head having the inner surface thereof flared so that the initial contact of said head with the flared end of the tube is at the free end of said head whereby during the clamping action said head will be expanded and will be brought into intimate contact with the outer surface of the flared end of the tube throughout substantially the entire extent of said flared surface on the head.

[Insert B1 and C2.]

In Testimony Whereof, I affix my signature.

/s/ ARTHUR L. PARKER,
Inventor's Full Name.

Defendant's Exhibit RR—(Continued)

OATH

City of Washington,
District of Columbia—ss.

Arthur L. Parker, the above-named petitioner, being duly sworn, deposes and says that he verily believes himself to be the original, sole and first inventor of the Improvements in Tube Coupling described and claimed in the accompanying specifications; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof or patented or described in any printed publication in the United States of America, or any foreign country before his invention or discovery thereof, or more than two years prior to this application; or in public use or on sale in the United States for more than two years prior to this application; that said invention has not been patented in any country foreign to the United States on an application filed by him or his legal representatives or assigns, more than twelve months prior to this application; and that no application for patent has been filed by him or his legal representatives or assigns in any country foreign to the United States, and that he is a citizen of the United States, and a resident of Cleveland, County of Cuyahoga, State of Ohio.

/s/ ARTHUR L. PARKER,
Inventor's Full Name.

Sworn to and subscribed before me, this 1st day of March, 1938.

[Seal] /s/ FRANCES P. SMITH,
Notary.

183
8,20

Fig. 1.

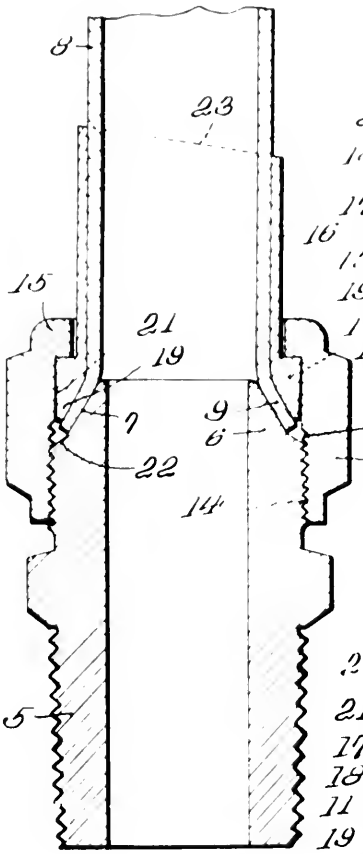


Fig. 2.

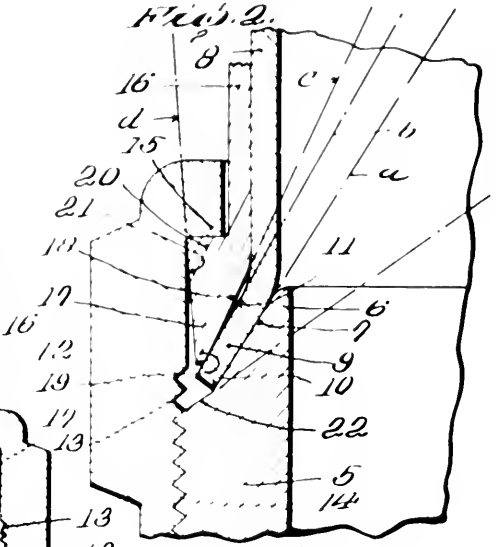
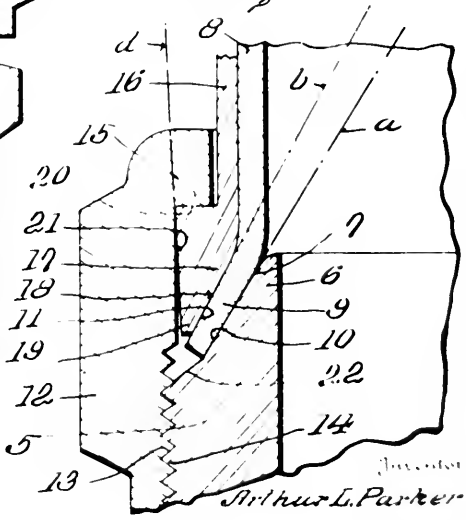


Fig. 3.



Inventor
Arthur L. Parker

By Munn & Co
Attorneys

285-86

52

14

193569

Defendant's Exhibit RR—(Continued)

Div. 52, Room 7709 Paper No. 3

Department of Commerce
United States Patent Office
Washington

Please find below a communication from the examiner in charge of this application.

/s/ CONWAY P. COE,
Commissioner of Patents.

Address to: Mason & Porter,
Loan & Trust Bldg.,
Washington, D. C.

Applicant: A. L. Parker
Ser. No.: 193,569
Filed: March 2, 1938
For: Tube Coupling

This application has been examined.

References made of record:

Dossert	772,136	Oct. 11, 1904	285-86
Parker	1,893,442	Jan. 3, 1933	285-86
Parker	1,977,240	Oct. 16, 1934	285-86
Parker	1,977,241	Oct. 16, 1934	285-86
Hewitt	1,820,020	Aug. 25, 1931	285-87

Claims 1, 2, 4 and 5 are rejected as being indefinite. The whereby clauses relative to the expanding of the head are not supported by sufficient structural recitations. In so far as the structure of these claims is concerned, the head may be made of such material that expansion is impossible, and also the

Defendant's Exhibit RR—(Continued)

head may fit so close within the outer sleeve member that expansion of the head will be prevented by contact of the head therewith.

Claims 1 to 5 are rejected as not being patentable over Parker, 1,977,241. To make the surfaces 5 and 16 and the cooperating surfaces of the tube conical in lieu of spherical would involve at most mere mechanical skill.

Claims 1 to 5 are also rejected on Parker, 1,977,-241, in view of Parker, 1,893,442, Hewitt, or Dossert. The last three patents show the use of tapered surfaces upon the various parts of this type of connection to be old, and in view of these disclosures it would involve only mechanical skill to substitute tapered surfaces for the spherical surfaces of Parker, 1,977,241.

2—S. N. 193,569

Claim 3 is also rejected as being fully met by Parker, 1,977,240.

/s/ M. K. KNOTTS,
Examiner.

Defendant's Exhibit RR—(Continued)

In the U. S. Patent Office
Div. 52, Room 7709

In re application of
A. L. Parker
Tube Coupling
Serial No. 193,569
Filed March 2, 1938

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Responding to the Official Action of April 25, 1938, please amend as follows:

Erase claim 1 through 5 and substitute:

—6. A tube coupling for clamping the flared end of a tube comprising male and female coupling members having a threaded engagement, said male coupling member having a coniform tapered seat adapted to extend into the tube end with which the flared end makes contact, said female coupling member including an inner sleeve which contacts with the flared end of the tube, and an outer sleeve having a cylindrical bore threadably engaged with the male coupling member, said inner sleeve having a normally tapered head provided with a shoulder against which said outer sleeve contacts and of a diameter for closely approximating the wall of said bore, said head being expansible and having the inner surface thereof provided with a coniform flare so shaped that the initial contact of said head with the flared end of the tube is at the free end of said head whereby during the clamping action

Defendant's Exhibit RR—(Continued)

said head will be expanded and will be brought into intimate contact with the outer surface of the flared end of the tube throughout substantially the entire extent of said flared surface on the sleeve head without causing the outer surface of the head to engage in clamping relation in said bore.—

Remarks

The rejected claims have been erased and a single claim substituted therefor which appears to patentably distinguish over the references of record. Effort has been made to word the substitute claim so as to avoid the criticisms as to form noted by the Examiner.

The new claim stresses applicant's particular arrangement of clamping surfaces and specifies that they are coniform as distinguished from spherical. The claim also clearly defines applicant's feature of tapering the external surface of the sleeve head in a manner making it possible to dimension the head for filling the bore of the coupling sleeve and yet remain out of clamping contact with the wall of the bore when the coupling is set. No single reference of record, nor any proper combination of the references cited, discloses the tapered sleeve head structure which makes it possible to form the clamping shoulder of the head 17 of a diameter for completely filling the bore of the sleeve 12 without danger of providing clamping contact between the opposed wall surfaces of the head 17 and the sleeve 12 when the coupling is securely clamped. The single claim now presented specifically defines ap-

Defendant's Exhibit RR—(Continued)

plicant's novel features and since these features provide advantages over and are not taught in the references of record, it is urged that the single claim now presented should be allowed.

Respectfully submitted,

A. L. PARKER,

By /s/ MASON & PORTER,
His Attorneys.

Washington, D. C.,
October 21, 1938.
CJD/MJI

Div. 52, Room 7709 Paper No. 5

Department of Commerce
United States Patent Office
Washington

Please find below a communication from the Examiner in charge of this application.

/s/ CONWAY P. COE,
Commissioner of Patents.

Address to: Mason & Porter,
Loan & Trust Bldg.,
Washington, D. C.

Applicant: Arthur L. Parker.
Ser. No. 193,569
Filed Mar. 2, 1938
For Tube Coupling

Responsive to amendment filed Oct. 22, 1938.
Claims 1 to 5 have been cancelled.

Defendant's Exhibit RR—(Continued)

Claim 6 the only claim in the case is rejected as devoid of any patentability over Parker 1,977,241 of record, which is held to show an equivalent device. The only differences over this reference are in matters of shape and proportions which do not enter into the combination in a way to change its effect or result. Parker 1,977,240 clearly shows the idea of having the clamping ring substantially filling the space in the nut when in a clamping position.

As a clear issue appears to have been reached, this action is made final. Ex parte Jackson 1926, C. D. 102.

/s/ M. K. KNOTTS,
Examiner.

G.B.B.

In the United States Patent Office
Before the Examiner,
Room 7709, Div. 52

In re application of
Arthur L. Parker,
Tube Coupling,
Filed March 2, 1938,
Serial Number 193,569.

Hon. Commissioner of Patents, Washington, D. C.

Sir:

Permission is requested to amend the above-entitled application by cancelling the claim which is under final rejection and to substitute therefor the claim presented with this amendment; also to correct the error in the specification.

Defendant's Exhibit RR—(Continued)

Page 5, line 12, after "flared" insert—end—

Page 7, line 17, before "cause" insert—move forwardly along the flared end of the tube to—

Cancel claim 6.

Add the following claim:

[B1]

1. In a coupling for tubes having the ends thereof flared, coupling members having threaded engagement with each other, one of said coupling members having a seat associated therewith adapted to engage the inner face of the flared end of the tube and the other coupling member having a clamping shoulder, a sleeve surrounding said tube and having a solid head provided with a shoulder against which the clamping shoulder of the coupling member engages, said head having the inner surface thereof provided with a coniform flare so shaped that the initial contact of the head with the flared end of the tube is at the free end of the head and adjacent the outer end of the flared end of the tube, whereby during the clamping action said head will be expanded and moved forward along the flared end of the tube into intimate contact with the outer surface thereof throughout substantially the entire extent of the flared surface on the sleeve head. [Add C2.]

Remarks

The above amendment has been prepared in view of an oral interview had with the Principal Examiner in charge of this application. At that time, the claim sought to be inserted by this amendment

Defendant's Exhibit RR—(Continued)

was informally presented to the Examiner. If the amendment cannot be entered and the claim allowed, it is respectfully requested that the claim be entered for appeal purposes.

It was pointed out at the interview that the patent to Parker No. 1,977,241 shows a tube coupling wherein the clamping portion 15 is spaced away from the shoulder portion 10 and the clamping action is quite different from that in the present structure where the head is solid. The solid head of the application has its tapered face normally on an angle to the flared end of the tube so that the free end of the head contacts with the flared end of the tube adjacent the outer end of said flared end. When the nut is turned to exert pressure against the sleeve, the head expands and moves forward along the flared end of the tube into intimate contact with the outer surface of the flared end of the tube throughout substantially the entire extent of the flared surface on the sleeve head. We, therefore, have in this new structure the benefit of elastic tension in the entire sleeve head to help seat the flared end of the tube. In applicant's prior patent, we only have the elastic tension of the part of the sleeve head. In applicant's prior patent, if extra tension is exerted after the sleeve lip has been seated flat against the flare, this extra tension will be exerted only on the base of the flare and there would be an excessive pressure at this point which would become increasingly out of proportion with the pressure at the end of the flare. When the sleeve head is solid as in the present application, the

Defendant's Exhibit RR—(Continued)

nut pressure is distributed more evenly over the entire flare.

Then again, in applicant's patent No. 1,977,241, there is a strong outward bending stress exerted on the thin section immediately adjacent the enlarged part forming the shoulder. Since the point where the nut pressure is applied is above and outward of this section, and since the lip portion exerts considerable leverage at this point, there will be a tendency for the sleeve to collapse inwardly at this point. When the sleeve head is solid there is no such weakened section below the point of nut pressure application, and hence no normal tendency toward collapsing.

It is believed that the claim as drafted above which brings out more clearly this solid head construction of applicant, against which the nut bears and which is also provided with a tapered surface for engagement with the flared end of the tube, is clearly a patentable feature of construction over that disclosed in applicant's prior patent.

Applicant's patent No. 1,977,240 also cited by the Examiner fails to anticipate this specific claim. This patent may show a solid head, but the flared end of the sleeve is constructed so that the inner portion of the tapered end contacts with the flared end of the tube. The shoulder on the nut and the shoulder on the head with which the nut contacts, are so shaped as to cause the head to swing inward to bring about a contact between the entire tapered face of the sleeve and the flared end of the tube.

Defendant's Exhibit RR—(Continued)

This construction is quite different from that disclosed in this application and covered by the claim as presented above. In applicant's present structure it is noted that the free end of the solid head contacts with the flared end of the tube adjacent the outer end thereof, and as the nut forces the head forward, the solid head will expand, retaining its tension so that two things are accomplished. First, the tapered surface of the solid head will contact with the outer flared surface of the tube throughout the entire extent of the tapered surface of the head, and in the second place, the head will be placed under tension so that it is constantly tending to grip the flared end of the tube. There is a clearance between the outer face of the solid head and the face of the nut which permits this expansion without bringing about a contact, and therefore, the tube is firmly gripped with an extending line of contact from one end of the tapered face of the head to the other, and it is gripped under this tension of the expansion of the solid head.

As pointed out at the interview, neither of these patents show the structure which applicant is claiming, and this structure accomplishes new functions which are not present in the structures of the patents cited, and it is believed the claim is clearly allowable.

It is respectfully requested, therefore, that the claim may be entered and the case allowed, notwithstanding the final rejection, but if the Examiner

Defendant's Exhibit RR—(Continued)

cannot allow the claim, it is still asked that the amendment be entered for appeal purposes.

Respectfully submitted,

ARTHUR L. PARKER,

By /s/ MASON & PORTER,
Attorneys.

Washington, D. C., June 29, 1939.
EGM:D.

Div. 52, Room 7709 Serial No. 193,569

Department of Commerce
United States Patent Office
Washington

July 5, 1939.

Arthur L. Parker:

Your Application for a patent for an Improvement in Tube Coupling filed Mar. 2, 1938, has been examined and Allowed with 1 claims.

The final fee, Thirty Dollars, With $1 Additional for Each Claim Allowed in Excess of 20, must be paid not later than Six Months from the date of this present notice of allowance. If the final fee be not paid within that period, the patent will be withheld, but the application may be renewed within one year after the date of the original notice with a renewal fee of $30 and $1 additional for each claim in excess of 20.

The office delivers patents upon the day of their date, on which date their term begins to run. The preparation of the patent for final signing and sealing will require about four weeks, and such

Defendant's Exhibit RR—(Continued)

work will not be begun until after payment of the necessary final fee.

When the final fee is paid, there should also be sent, Distinctly and Plainly Written, the name of the Inventor, Title of the Invention, and Serial Number as Above Given, Date of Allowance (which is the date of this circular), Date of Filing, and, if assigned, the Names of the Assignees.

If it is desired to have the patent issue to an Assignee or Assignees, an assignment containing a Request to that effect, together with the Fee for recording the same, must be filed in this office on or before the date of payment of the final fee.

After issue of the patent, uncertified copies of the drawings and specifications may be purchased at the price of Ten Cents Each. The money should accompany the order. Postage stamps will not be received.

The final fee will not be received from other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office.

Notice.—When the Number of Claims Allowed Is in Excess of 20, No Sum Less Than $30 Plus $1 Additional for Each Claim in Excess of Twenty Can Be Accepted as the Final Fee.

Repectfully,

/s/ CONWAY P. COE,

Commissioner of Patents.

Addressed to: Mason & Porter,
Loan & Trust Bldg.,
Washington, D. C.

Defendant's Exhibit RR—(Continued)

In the United States Patent Office

In re application of
Arthur L. Parker,
Tube Coupling,
Filed March 2, 1938,
Serial Number 193,569,
Allowed July 5, 1939.

Before the Examiner, Room 7709, Div. 52.

PETITION FOR RENEWAL

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Your petitioner, Arthur L. Parker, a citizen of the United States and a resident of Cleveland, in the County of Cuyahoga, and State of Ohio, whose Post-Office address is 17325 Euclid Avenue, Cleveland, Ohio, represents that on March 2, 1938, he filed an application for Letters Patent for an improvement in Tube Couplings, Serial Number 193,569, which application was allowed July 5, 1939. He now makes renewed application for Letters-Patent for said invention and prays that the original specification, oath and drawings together with the amendment to the description attached hereto may be used as a part of this application. Renewal fee of $30.00 herewith.

Respectfully,

ARTHUR L. PARKER,

By /s/ MASON & PORTER,
Attorneys.

Washington, D. C., Jan. 18, 1940.

Defendant's Exhibit RR—(Continued)

In the United States Patent Office

In re application of
Arthur L. Parker,
Tube Coupling,
Filed March 2, 1938,
Serial Number 193,569,
Allowed July 5, 1939.

Before the Examiner, Room 7709, Div. 52.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In the above-entitled application, please amend as follows:

Page 7, at the end of line 24, add **[C1]**.

It is noted that the clamping shoulder on the head 17 is spaced a distance back from the inner flare surface of said head and the outer surface of the head and said inner wall of the coupling are so dimensioned that the head will contact with the nut in the region of the clamping shoulder, while the remaining portion of the head is free from contact with the coupling member, and therefore, the clamping force of the head against the tube is determined by the spring tension of the metal forming the head. In other words, the inner flare surface of the sleeve will yieldingly clamp the flared tube end while unlimited expansion of that portion of the head adjacent the clamping shoulder will be prevented.

Defendant's Exhibit RR—(Continued)

Add the following claims [C2].

2. 8. In a coupling for tubes having the ends thereof flared, coupling members having threaded engagement with each other, one of said coupling members having a seat associated therewith for engaging the inner flare of the flared end of the tube and the other coupling member having a clamping shoulder and an inner wall, a sleeve surrounding said tube and having a solid head capable of radial expansion during the clamping action, said head being provided with a clamping shoulder against which the shoulder of the coupling member engages and an inner flare surface for engaging the outer flared end of the tube, said clamping shoulder being spaced a distance back of the inner flare surface, the outer surface of said head and the said inner wall of the coupling member being so shaped relative to each other that when the sleeve head expands during the clamping action they will contact only in the region of the clamping shoulder, the remaining portion of the head being free from contact with the coupling member whereby the clamping force of the head against the tube is determined by the spring tension of the metal forming said head.

3. 9. In a coupling for tubes having the ends thereof flared, coupling members having threaded engagement with each other, one of said coupling members having a seat associated therewith adapted to engage the inner face of the flared end of the tube and the other coupling member having a clamping shoulder, a sleeve surrounding said tube and having a solid head provided with a shoulder

Defendant's Exhibit RR—(Continued)

against which the clamping shoulder of the coupling member engages, said head having the inner surface thereof provided with a coniform flare so shaped that the initial contact of the head with the flared end of the tube is at the free end of the head and adjacent the outer end of the flared end of the tube, the outer surface of said head and said inner wall of the coupling member being so shaped relative to each other that when the sleeve head expands during the clamping action, the portion of said head contacting with the flared end of the tube is at all times out of contact with the coupling member whereby the clamping face of the head against the tube end is determined by the spring tension of the metal forming said head.

Remarks

It is believed that the claims presented above are patentable as well as the claim which was allowed in this case. The amendment to the description more clearly defines the shaping of the head relative to the nut so that the head when it is expanded contacts with the nut adjacent the shoulder while the remaining portion of the head is out of contact with the nut, and therefore,the clamping pressure of the head of the sleeve when the nut is turned on to the male member is determined by the spring tension of the metal forming said head.

Claim 8 is directed specifically to this dimensioning of the head of the sleeve whereby this clamping action is determined by the spring tension of the metal forming the head, and it is believed it is

Defendant's Exhibit RR—(Continued)

clearly allowable over the art made of record, and in particular, applicant's own patent #1,977,240.

Claim 9 includes both the features of the head being shaped so as to contact with the flared end of the tube at the nose end of the sleeve, and also that the head is so shaped relative to the nut as to be out of contact therewith during the clamping action, so that the clamping force of the head against the tube is determined by the spring tension of the metal forming the head.

Respectfully submitted,

ARTHUR L. PARKER,

By /s/ MASON & PORTER,
Attorneys.

Washington, D. C., January 18, 1940.
EGM:D.

Div. 52, Room 7709 Serial No. 193,569-Ren.

Department of Commerce
United States Patent Office
Washington

January 26, 1940

Arthur L. Parker

Your Application for a patent for an Improvement in Tube Coupling filed Mar. 2, 1938, has been examined and Allowed with 3 claims.

The final fee, Thirty Dollars, With $1 Additional for Each Claim Allowed in Excess of 20, must be paid not later than Six Months from the date of

Defendant's Exhibit RR—(Continued)

this present notice of allowance. If the final fee be not paid within that period, the patent will be withheld; See Revised Statutes, Section 4885 as Amended By Act of Congress Approved August 9, 1939.

The office delivers patents upon the day of their date, on which date their term begins to run. The preparation of the patent for final signing and sealing will require about four weeks, and such work will not be begun until after payment of the necessary final fee.

When the final fee is paid, there should also be sent, Distinctly and Plainly Written, the name of the Inventor, Title of the Invention, and Serial Number as Above Given, Date of Allowance (which is the date of this circular), Date of Filing, and, if assigned, the Names of the Assignees.

If it is desired to have the patent issue to an Assignee or Assignees, an assignment containing a Request to that effect, together with the Fee for recording the same, must be filed in this office on or before the date of payment of the final fee.

After issue of the patent, uncertified copies of the drawings and specifications may be purchased at the price of Ten Cents Each. The money should accompany the order. Postage stamps will not be received.

The final fee will Not be received from other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office.

Defendant's Exhibit RR—(Continued)

Notice.—When the Number of Claims Allowed Is in Excess of 20, No Sum Less Than $30 Plus $1 Additional for Each Claim in Excess of Twenty Can Be Accepted as the Final Fee.

Respectfully,

/s/ CONWAY P. COE,
Commissioner of Patents.

This Application Cannot Be Renewed

Addressed to: Mason & Porter,
Loan & Trust Bldg.,
Washington, D. C.

Final Fee Paid to the Commissioner of Patents
(Be careful to give correct Serial No.)

Jul. 23-40 15149D—Check—30.00

Serial No. 193,569
Inventor: Arthur L. Parker.
Patent to Be Issued to: As per record.
Name of Invention, As Allowed: Tube Coupling.
Date of Payment: July 23, 1940.
Fee: Thirty Dollars.
Date of Filing: March 2, 1938.
Date of Circular of Allowance: Jan. 26, 1940.

The Commissioner of Patents will please apply the accompanying fee as indicated above.

MASON & PORTER,
Attorneys.

Send Patent to: Mason & Porter, 900 F. Street N.W., Washington, D. C.

Final fees will not be received from other than

Defendant's Exhibit RR—(Continued)

the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office, Nor Will They Be Applied in Pending Applications.

[A. L. Parker Patent No. 2,212,183. See page 1323 of this printed Book of Exhibits.]

District Court of the United States, Southern District of California, Central Division

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (42 Stat. L. 392), you are advised that there was filed on the 4th day of March, 1948, in this court an action, suit, or proceeding No. 8023-W Civil, entitled:

Name: The Parker Appliance Company, Plaintiff.
Address: Cleveland, Ohio.

Versus

Name: Joseph C. Collins, doing business under firm name and style of Collins Engineering Co., Defendant.
Address: Hollywood, Calif.

brought upon the following patents:

Patent No. 2,212,183.
Date of Patent: Aug. 20, 1940.
Patentee: Arthur L. Parker, Cleveland, Ohio.

In the above-entitled case, on the .... day of ....., 193 , the following patents have

Defendant's Exhibit RR—(Continued)

been included by ..... (insert amendment, answer, cross bill, or other pleading):

Patent No. .....

Date of Patent: .....

Patentee: .....

In the above-entitled case the following decision has been rendered or decree issued:

.....

In Witness Whereof I have affixed my hand this 14th day of March, 1948, at Los Angeles, Calif.

EDMUND L. SMITH,
Clerk of Said Court.

By /s/ L. B. FIGG,
Deputy Clerk.

Defendant's Exhibit RR—(Continued)
District Court of the United States, Southern District of California, Central Division

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (42 Stat. L. 392), you are advised that there was filed on the 29th day of December, 1948, in this court an action, suit, or proceeding No. 7874-B, entitled:

Name: The Parker Appliance Company, Plaintiff.
Address: Cleveland, Ohio.

Versus

Name: Irvin W. Masters, Inc., Defendant.
Address: Burbank, California.

brought upon the following patents:

Patent No. 2,212,183.
Date of Patent: Aug. 20, 1940.
Patentee: Arthur L. Parker.

In the above-entitled case, on the .... day of ....., 193 , the following patents have been included by ..... (insert amendment, answer, cross bill, or other pleading):
Patent No. .....
Date of Patent: .....
Patentee: .....

In the above-entitled case the following decision has been rendered or decree issued:

.....

In Witness Whereof I have affixed my hand this

Defendant's Exhibit RR—(Continued)

20th day of January, 1948, at Los Angeles, Calif.

EDMUND L. SMITH,
Clerk of Said Court.

By /s/ R. B. CLIFTON,
Deputy.

District Court of the United States, Southern District of California, Central Division

Supplemental Report of Additional Patents

Honorable Commissioner of Patents,
Washington, D. C.

Sir:

In compliance with the Act of February 18, 1922 (42 Stat. L. 392), you are advised that there was filed on the 4th day of March, 1948, in this court an action, suit, or proceeding No. 8023-W Civil, entitled:

Name: Parker Appliance Company, Plaintiff.

Address: .....

Versus

Name: Joseph C. Collins, doing business as Collins Engineering Co., Hollywood, Calif., Defendant.

Address: .....

brought upon the following patents:

Patent No. 2,212,183.
Date of Patent: Aug. 20, 1940.
Patentee: Arthur L. Parker.

In the above-entitled case, on the 16th day of

shall be accepted as proof that in the case of each of such patents a copy thereof was received by the United States Patent Office and deposited in the library thereof on the date shown by the Patent Office stamp thereon and that from that date it has been continuously open and accessible to the public; the foregoing being subject to correction should error be made to appear.

That the photostatic copies attached hereto and entitled on the first thereof "Pipes and Tubes" are true copies of pages of a printed publication entitled "Pipes and Tubes" by Philip R. Bjorling, and that said publication, including said pages, was published during the year 1902 in London, and that said publication was catalogued in the Library of Congress of the United States on October 16, 1902, and since that date has been available to the public in the Library of Congress.

Dated: This 7th day of June, 1950.

LYON & LYON,

/s/ CHARLES G. LYON,
Attorneys for Plaintiff.

HUEBNER, BEEHLER, WORREL, HERZIG and CALDWELL,

/s/ HERBERT A. HUEBNER,
Attorneys for Defendant.

Received in evidence June 23, 1950.

Pipes and Tubes

Their Construction and Joining

Together With

All Necessary Rules, Formulae, and Tables

By

Philip R. Bjorling

Hydraulic Consulting Engineer

Author of 'Mechanical Engineer's Pocket-Book,' etc.

With 191 Illustrations

London

Whittaker and Co.

White Hart Street, Paternoster Square

New York: 66 Fifth Avenue

1902

the lead pipe and the ring. Such joints have been carefully tested, and found to withstand a greater pressure than the pipe itself. The essential part of the joint is the brass ring *C*, which forms a support for the solder, and reduces the workman's task merely to wiping off the

Fig. 85.

superfluous metal. The wiping rings are manufactured by Mr. Holt of Liverpool. For wiping, strong cotton bed-tick when old and soft is very good, but the best material is "fustian" or skin. The cloth requires to be well greased before using, but not too much, as it will make the joint look dirty when finished.

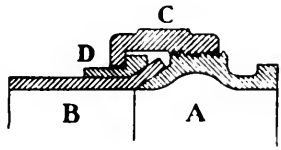


Fig. 86.

A modification of above joint, which requires still less solder, is illustrated in Fig. 85; it will be noticed that the solder is only required round each end of the ring.

Many methods have been adopted for connecting lead pipes to pumps and other machinery, but as all methods

possess certain features in common we need only illustrate one example. This is illustrated in Fig. 86. In this case *A* is the casting to which the lead pipe *B* has to be connected. The casting is screwed on the outside and fitted with a nut *C*. There is a bush placed over the pipe and inside the nut. The outside of the casting *A* is coned at the end to fit the inside of the bush *D*, so that when the nut is tightened the lead pipe is coned and a tight joint is effected.

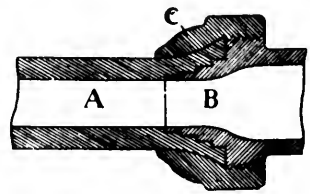
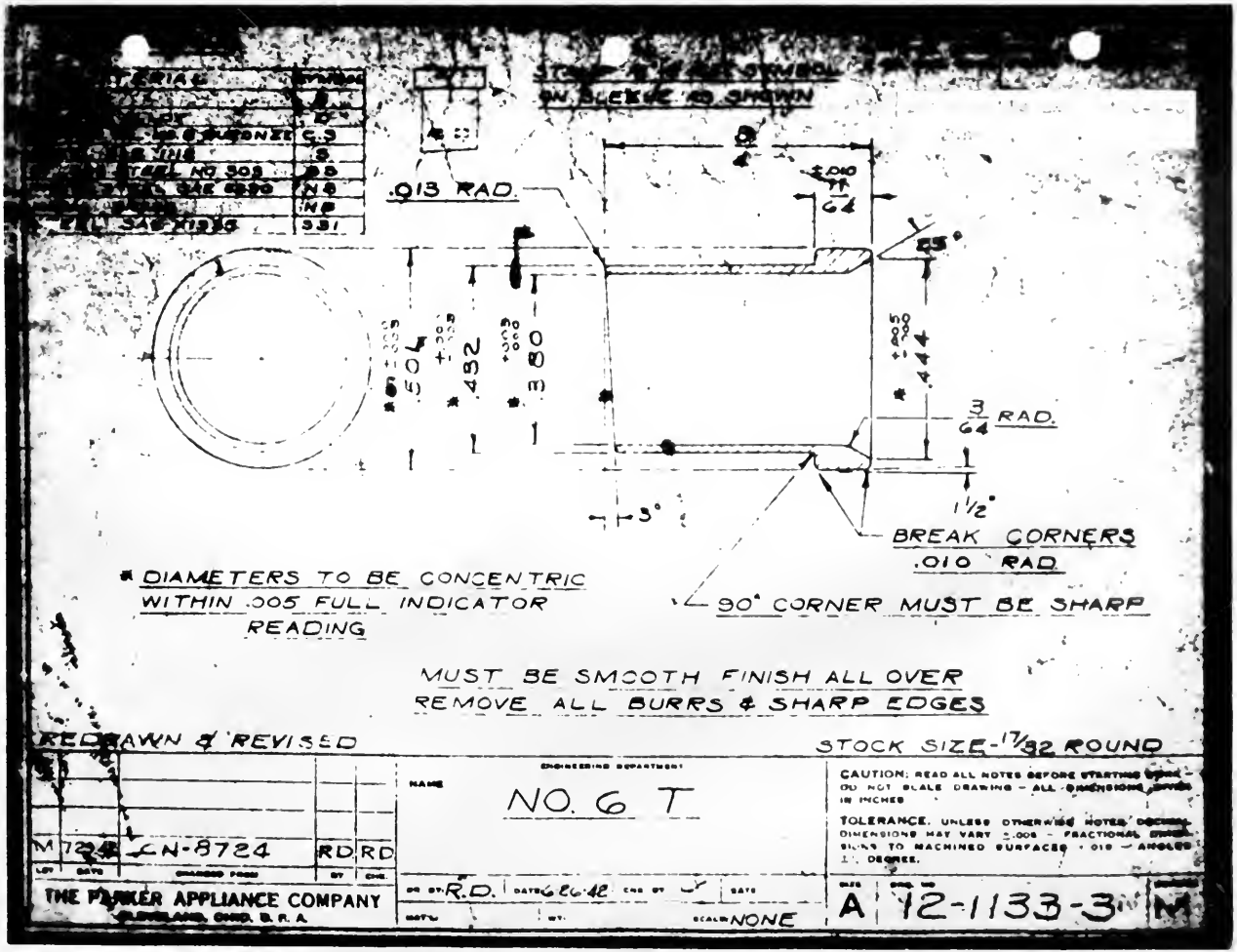
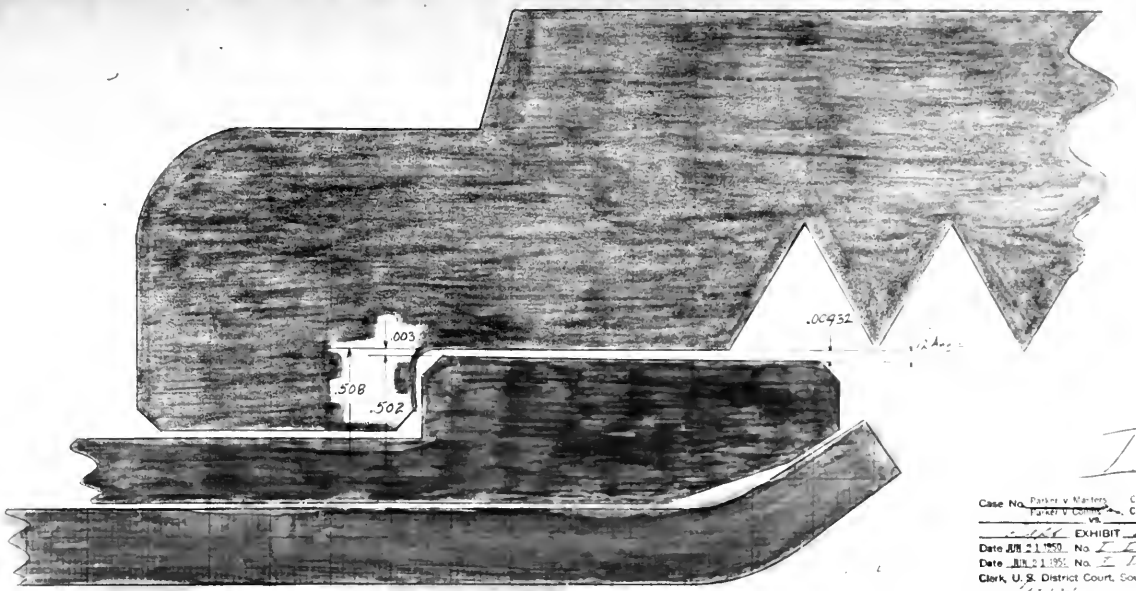


Fig. 87.

A patent "grooved" joint for fixing lead pipes without solder, manufactured by Messrs. J. Tylor & Sons, Ltd., London, is illustrated in section, Fig. 87. *A* is the lead pipe, *B* a taper brass piece, and *C* a brass nut. If the joint is to be made with a light pipe, place the diminishing lining into the nut *C*. If strong lead pipe is used it will not be required. Unscrew the brass nut *C*, and slip it over the end of the lead pipe. Swell out the end of the lead pipe by driving into it a taper piece of hard wood, the same taper as the piece *B*. Trim off the end of the lead pipe square, and having well greased the outside end


.013 RAD.
.010
64
25°
.505
.444
.432
.380
3/64 RAD.
3°
1 1/2°
BREAK CORNERS
.010 RAD.
* DIAMETERS TO BE CONCENTRIC WITHIN .005 FULL INDICATOR READING
90° CORNER MUST BE SHARP
MUST BE SMOOTH FINISH ALL OVER
REMOVE ALL BURRS & SHARP EDGES
REDRAWN & REVISED
STOCK SIZE-17/32 ROUND
NO. 6 T
CAUTION: READ ALL NOTES BEFORE STARTING WORK
DO NOT SCALE DRAWING - ALL DIMENSIONS GIVEN IN INCHES
TOLERANCE. UNLESS OTHERWISE NOTED DECIMAL DIMENSIONS MAY VARY ±.005 - FRACTIONAL DIMENSIONS TO MACHINED SURFACES ±.010 - ANGLES ±1° DEGREE.
M 7248 CN-8724 RD RD
THE PARKER APPLIANCE COMPANY
CLEVELAND, OHIO, U.S.A.
DR BY R.D. DATE 6-6-42
SCALE NONE
A 12-1133-3 M

1470



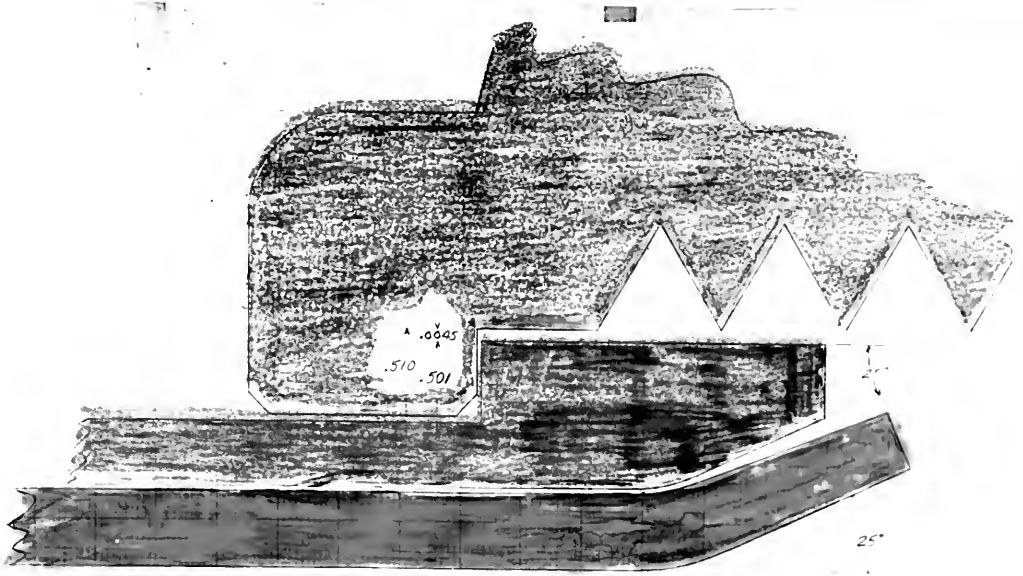
I

Case No. Parker v Masters C A No 7974 B
Parker v Commer C A No 8023 B
vs.
EXHIBIT E
Date JUN 21 1950 No. E IDENTIFICATION
Date JUN 21 1950 No. E IN EVIDENCE
Clerk, U. S. District Court, Sou Dist of Calif
By Deputy Clerk

AN-6 Scale 40-1
To Minimum Clearance
Assembly Drw Dwgs
AN818(NG7), AN819(Sleeve) AND1306(Flare)
Section No 5

JJ

Case No. Parker v Masters · C A No 7874 B
Parker v Collins · C A No 8023 B
vs.
EXHIBIT
Date JUN 21 1950 No. IDENTIFICATION
Date JUN 21 1950 No. IN EVID
Clerk, U. S. District Court, Southern Dist
By Deputy Clerk



Assembly from Parker 1935 Drawing
Scale NONE

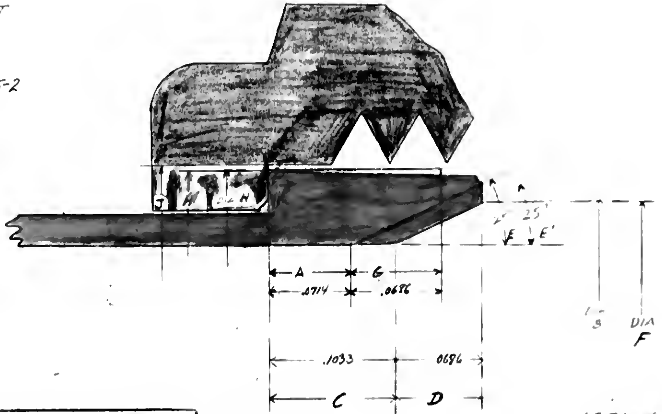
Parker Nut 2-17½ - 21
Parker Sleeve 2- [illegible]

Maximum Clearance Load - [illegible]
Section No 6

1472

COMPARATIVE CHART

AC811-6 (UNMODIFIED) Sleeve
Compared with
PARKER-6 of Dwg. 2-1835-2
Section No 7



SLEEVE SIZES	PARKER DRAWING 2-1835-2 A	G	E	DIA B	CURRENT 811 T SLEEVE C	D	E'	F	H	H'	J
-2	.0875	.0462	35½°	.195	.0645	.0445	35½°	.195	.260	.267	.267
-3	.0572	.0511	35½°	.265	.0909	.0497	35½°	.265	.337	.329	.330
-4	.06425	.0451	33°	.310	.0515	.0435	33°	.310	[illegible]	.373	.383
-5	[illegible]	.0414	33°	.318	.0986	.0470	33°	.375	.443	.49	.406
-6	.0712	.0486	25°	.444	.1033	.0676	25°	.444	.503	[illegible]	.503
-8	.0923	.0896	30°	.577	.1131	.0900	25°	.577	.650	[illegible]	.696
-10	.1176	.0759	30°	.719	.1272	.0757	30°	.711	.810	.777	.813
-12	.1155	.1032	30°	.875	.1465	.1032	30°	.875	.920	.976	.985
-16	.1155	.1032	30°	1.125	.1467	.1032	30°	1.125	1.250	1.222	1.255
-20	.0834	.1124	30°	1.406	.1371	.1285	30°	1.406	1.575	1.557	1.540
-24	.1631	.1131	30°	1.641	.1666	.1146	30°	1.640	1.795	1.774	1.798
-32	.1936	.1502	30°	2.127	.2029	.1584	30°	2.177	2.425	2.404	2.410

AC811-6 STEEL SLEEVE
PARKER-6 2-1835-2 SLEEVE
PARKER [illegible]
THE PARKER [illegible] IS [illegible]
PARKER SLEEVES AS PER DRAWING No 2-1835-1 and 2-1835-2 (DATE 2-18-38) IN COMPARISON WITH AC SLEEVES TO CURRENT DIMENSIONS

Scale 20:1